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A STUDY OF THE MILIARY PLAQUES FOUND IN BRAINS OF THE AGED.*

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I. Introduction.

Although miliary sclerosis of senile brains was reported by Redlich more than twelve years ago, and Blocq and Marinesco even six years prior had called attention to a like condition in two aged subjects, one of which was an epileptic, the literature of the structures discussed in this paper is not extensive. Within the last three years, however, so-called plaques, now recognized as identical with the miliary sclerosis of Redlich and common though not constant findings in the brains of persons dying at an advanced age, have been studied intensively and with illuminating results. While many interesting details concerning miliary plaques of the brain have been established, the last word, perhaps, has not been said. As to the origin and nature of these miliary plaques opinions differ, some even taking on the character of polemics.

Psychoses occurring in the period of senium have received less attention from the clinicians and anatomists, consequently, are less understood than some other psychoses with equally unfavorable prognosis—as an example, general paresis. Largely for the reason of a commonly expected fatal outcome in a mental disease affecting persons already near the end of the allotted span of life, senile cases have been given comparatively little study. It has been the object of this paper to add to already existing clinical and anatomical data, data of such character which when sufficiently accumulated and properly correlated may serve to explain

many obscure clinical states and aid in establishing a more definite histopathology for the types of involution psychoses. To this end material from 33 elderly subjects dying insane has been employed for study. By way of comparison brain tissue from 6 elderly persons dying without psychosis and sections from the brain and spinal cord obtained from 50 younger subjects dying of various mental diseases have been added. The material from elderly persons dying without psychosis was kindly furnished by Dr. F. B. Mallory from the autopsies of Boston City Hospital for the years 1909 and 1910. The remaining subjects came to autopsy at Westborough State Hospital; the 33 elderly persons, with the exception of 2 cases in which plaques were demonstrated in sections prepared 5 years ago, during 1909, 1910 and the first 3 months of 1911, while the 50 younger subjects are from autopsies of the past 6 years.

II. Nature and Origin of Plaques.

The special contributions as well as incidental notes on miliary plaques to be found in the literature of the histopathology of the brain have been reviewed recently by Perusini[1] and also by Huebner.[2] More recently, and since the completion of the examinations here reported, the paper by Barrett[3] concerning degeneration of intracellular neurofibrils associated with miliary gliosis, the monograph by Simchowicz[4] on the histopathology of senile dementia and Alzheimer's[5] report of a new case of senium præcox have appeared. In these three last-mentioned papers plaque literature is cited in full. The references which follow, therefore, will not be inclusive, but will be confined to the principal contributions and the views set forth to explain the origin, nature and clinical significance of the plaques—those peculiar miliary areas frequently found in the brains of persons dying at an advanced age and with which psychosis may or may not have been associated.

Historical.—The observations of Redlich[6] (1898) with regard to miliary plaques of the brain concerned 2 cases of senile cerebral atrophy—general and focal atrophies—associated clinically with memory defect, mental confusion, amnesic aphasia and asymbolic apraxia. Similar findings, however, in the brain of an aged epileptic and the case of an elderly subject who had shown clinic-

ally dementia, aphasia, asymboly and epileptiform attacks, were reported earlier by Blocq and Marinesco[7] (1892). Redlich described the miliary plaques as consisting of numerous fine glia fibers and moderately large glia cells exhibiting a slight alteration in shape and some pigmentation, many of the plaques presenting regressive changes. The regressive changes were shown in a loss of sharpness in the contour of the proliferated fibers and occasionally in a homogeneous or granular appearance of the entire plaque. These miliary areas, generally circular in outline and varying in diameter from that of a ganglion cell to a diameter 4 to 6 times as great as such a cell, were interpreted as the result of focal compensatory glia proliferation supervening the destruction of ganglion cells. The reason which Redlich gave for this view was the preponderance of plaques in cortical laminæ where, *pari passu,* ganglion cells were the most degenerated. In Redlich's cases the layers of small and medium-size pyramidal cells offered the maximum of ganglion cell degeneration and plaque formation. It was admitted, however, that the proliferative changes comprised in each of the miliary foci were in excess of the reactive gliosis which usually follows the destruction of a ganglion cell. As to the origin of plaques, Cramer,[8] in his discussion of the pathological anatomy of the psychoses (1904) comes to a conclusion similar to Redlich's.

Miliary plaques in the brains of senile dements were also described by Alzheimer[9] (1904). In this early observation, the plaques to which Alzheimer called attention were composed of a felt-work of fine glia fibers surrounding corpora amylacea, or other bodies the nature of which was not clear, and were considered as identical with the *miliare Sklerose* of Redlich. Later (1906), at a meeting of the *südwest deutscher Irrenärzte,* Alzheimer[10] made a preliminary report of a case in which he had found rather peculiar and hitherto undescribed alterations of the intracellular neurofibrils of cerebral ganglion cells. Associated with the peculiar neurofibril changes were miliary plaques of the cerebral cortex. In explanation of the plaques the position was taken that their presence was due to deposition in the brain tissue of chemical substances resulting from pathological metabolism of nervous elements. Various chemical substances, which he designated collectively as *Aufbau Produkte,* could be demonstrated in

the plaques by staining sections with certain dyes after the employment of suitable fixatives.

About the same time (1906), Mijake [11] reported finding plaques in the brains of 2 senile dements. The glial nature of the plaques was emphasized, for they were described as *glia Rosette.*

Léri [12] in his treatise on the senile brain (1906), devotes a chapter to the particular structures under discussion, there designated as *sclerose nevroglique miliare.* Two illustrations are given of the appearance of the plaques in the cerebral cortex of a person dying at the age of 58, having previously suffered epilepsy, a rather pronounced dementia and marked aphasic disturbances. Léri explained the epileptic attacks in this case as resulting from the irritation produced by the sclerotic miliary plaques.

Herxheimer and Gierlich [13] in their neurofibril studies (1907) reproduce photographically the plaques demonstrated in a section prepared after the silver impregnation method of Bielschowsky. These observers look upon the plaques not only as characteristic of the senile cortex, but also as resulting from greatly altered cells—swellings and subsequent disintegration.

Fischer [14] (1907) employing Bielschowsky's neurofibril method in a series of observations on the cortex of senile dementia and other psychoses could find the characteristic plaques in senile dementia only. Indeed, even in this group of the psychoses, plaques were confined to cases of presbyophrenia. The pathological process which led to the formation of plaques Fischer attributed to a "drusy necrosis" and he was convinced that their presence in a given brain was of sufficient diagnostic importance to differentiate presbyophrenia from "simple senile dementia" and the non-senile psychoses. Later (1908), after having studied 37 cases of senile dementia, 50 cases of paralytic dementia and 23 cases of other psychoses, Fischer [15] was still unable to find plaques in cases other than presbyophrenia. In Fischer's earlier communication, club-like proliferation of axis cylinders surrounding the plaques were described and these were assumed to be the result of the necrotic process acting as an irritant upon the nervous elements. In the later report the opinion as to the nature of the plaques (necrotic foci surrounded by club-like proliferations of axis cylinders) was modified and a bacterial origin was argued.

If, as Fischer maintained, the plaques are to be found in cases of presbyophrenia only (he looks upon them as the anatomical substratum of this psychosis), and if their bacterial origin be true, there would be good warrant for a revision of our conceptions of presbyophrenia. The psychosis would then come naturally in the infective-toxic group and would possess a histopathology as definite as that of general paresis. But the plaques are found in cases other than presbyophrenia, as this study and the observations of others show. G. Oppenheim [16] found plaques in the brain of an aged man dying from gastric carcinoma but who had always enjoyed mental health. Perusini [1] mentions the case of a young tabetic (31 years of age without psychosis) in whose brain Alzheimer found plaques morphologically and tinctorially identical with the miliary areas encountered in certain senile brains. In the present series of cases (*vide infra*) a man 80 years of age and without psychosis exhibited plaques in abundance. Moreover, the bacterial origin of the plaques has not been substantiated by subsequent observers, nor can the findings in the group of cases here reported support the claim. More recently Fischer [17] has designated the plaques as *sphærotrichia multiplex cerebri* and contends that in the pictures furnished by the Bielschowsky method the fibrillary components of the plaques are the most characteristic and important, while the other cellular elements are only secondary and the expression of a reaction to nerve fibril proliferation. For Wada [18] the plaques are nothing more than circumscript necroses of the nervous parenchyma and glia apparatus.

Among the more recent investigators who have studied the plaques, Bonfiglio [19] (1908) contends that these miliary areas cannot be explained as the result of focal alterations in axis cylinders, as Fischer claims, nor as the result of deposition in the brain tissue of the products of pathological metabolism, which some hold to be the case; but the changes which give rise to the formation of plaques begin with degenerative alterations in ganglion cells and the immediately surrounding terminal arborizations of axis cylinders. Bonfiglio sees in the central nuclear-like mass which characterizes the majority of plaques nothing but the necrotic remains of a ganglion cell. This is a view quite in harmony with the position originally taken by Redlich.

G. Oppenheim [18] (1909) in 6 cases of senile dementia with symptoms of presbyophrenia could demonstrate the plaques in 3 of the cases. Two out of 3 cases of senile dementia with multiple arteriosclerotic foci exhibited a few plaques, while in the brain of an aged man (77 years at death) dying of gastric carcinoma and without psychosis plaques were abundant. Oppenheim also described club-like swellings surrounding the plaques which, however, were shown by Weigert's glia stain to be glia fibers and not axis cylinders.

Perusini [1] (1909) reports in detail 4 cases past middle life which offered clinically much the same mental condition and anatomically presented plaques together with most extraordinary intracellular degeneration of neurofibrils in cerebral ganglion cells. Preliminary reports had been made on 2 of Perusini's cases, one by Alzheimer [10] (*vide supra*) and the other by Bonfiglio.[19] Perusini's cases were characterized by a slow but steadily progressive mental enfeeblement, disturbances of orientation, difficulty in naming objects, intellectual deficit—amounting in some of the cases to complete mental blindness—and disturbances of the projection system. Employing Alzheimer's original description, the peculiar neurofibril changes were thus reported: "In an otherwise apparently normal cell one or more fibrils, on account of increased thickness, or intense staining, stand out prominently. Following this initial change many of the neighboring fibrils of the same cell undergo a like change and are then welded together to form a thicker and more darkly stained bundle which gradually comes to the surface of the cell. Finally, the nucleus and interfibrillary protoplasmic substance of the cell disappear completely and all that remains of the cell is a darkly stained snarl of neurofibrils." The plaques were described as consisting of a central darkly-staining homogeneous mass and two concentric rings. In the inner ring substances of variable chemical composition are deposited, the exact character of which is difficult to determine, while the outer ring is glial in nature.

Although admitting that there is much unknown and many points not clear as to the clinical significance of these structures, Perusini offers good reasons for considering the miliary plaques as resulting from degeneration or disintegration of nervous elements. Following the destruction of nervous elements there is a

thickening of the glia reticulum, in the meshes of which the products of pathological metabolism are deposited and undergo further chemical elaboration. The surrounding glia elements react to the deposit in much the same way as to a foreign body by an active fiber proliferation seeking to encapsulate the focus.

Huebner[3] (1909) reports 2 cases over 60 years of age, not insane, 16 cases with clinical histories of senile dementia, senile confusion, senile persecutory delusions, late epilepsy, multiple focal softenings and aphasia diagnosed on the basis of anatomical findings. Besides, 14 cases comprising tuberculous meningitis, purulent meningitis, brain tumor, multiple sclerosis, mania, general paresis, dementia præcox, Huntington's chorea and cerebral arteriosclerosis were examined. Huebner did not find plaques in the 2 cases without psychosis, but found them in the case of a manic-depressive 79 years of age who, however, had shown no considerable dementia during life. Plaques were also found in the case of an alcoholic dement 66 years of age and in the neighborhood of a recent hæmorrhage into the optic thalmus of an elderly man—a senile dement 66 years of age with clinical symptoms similar to those of general paresis. In the special group of 14 cases no plaques were found. Huebner sought to establish whether or not the presence of plaques in a given series of brains had any worth as a differential diagnostic factor for presbyophrenia and also to determine their medico-legal importance. The conclusions of this observer are as follows: the presence of miliary plaques in the brain is not characteristic for any special psychosis; that the subject had at least reached the 5th decade is the most that could be medico-legally advocated.

Bickel[20] (1910) reports 3 cases—recent apoplexy in a subject 65 years of age, a focal lesion of 5 months duration as the result of apoplexy in a subject 70 years of age and the case of a young girl 18 years of age with solitary tubercle of the pons—differentiating two varieties of plaques. One of these varieties is composed of dark and yellow granules (blood pigments) which have been engulfed by phagocytic cells and as the result of grouping or coalesence of such cells plaques have been formed. The other variety of plaque described by Bickel is claimed to be the direct result of ganglion cell degeneration. It is this latter variety which bears a closer resemblance to the plaques discussed in this

paper and to which Bickel assigns an origin identical with that advocated by Redlich.

Barrett[3] (1911) describes the clinical course and anatomical findings in 8 elderly subjects coming to autopsy in which plaques were found, 7 of the cases presenting the Alzheimer type of intracellular neurofibril degeneration. Barrett's cases, with one exception, were "distinctly of the senile period . . . . differing from the presbyophrenic form of senile insanity, and pathologically from the arteriosclerotic form." Symptoms of organic brain disease were prominent. Barrett suggests that the peculiar neurofibril changes in combination with plaques and certain focal atrophies found in his cases offer "explanations of a special clinical group of senile psychoses."

Simchowicz[4] (1911) in the report of a study of 108 brains from elderly persons, 14 of which were from subjects dying without psychosis, 36 from subjects with psychoses which were not of the senile type, the remainder senile psychoses, lays special stress on the presence of plaques as a diagnostic anatomical feature of senile dementia. Simchowicz is of the opinion that those cases which course clinically as senile dementia and yet fail to show plaques anatomically probably belong to a special group, or to other already differentiated psychoses. Sixteen cases so considered by Simchowicz are not convincing; the majority, judging from the histories which he cites, could scarcely be considered from the clinical histories as "senile dementia without a doubt" (to use a not uncommon phrase) and from the anatomical findings many would be ruled out instanter. Regarding the plaques this observer concludes: With certain exceptions, plaques occur in the brains of the aged only. Although appearing sparsely in the brains of elderly subjects without psychoses, plaques may be found with fair regularity from the 80th to the 90th year onward. Certain psychic and somatic diseases may hasten the appearance of plaques. Only in senile dementia are plaques found in great abundance.

For Simchowicz the difference between normal senium and senile dementia is but a difference in degree and he sees in the plaques to be found in the brains of elderly persons dying without psychosis, together with other interesting histological data which are ably reported in his paper, further confirmation of this view.

Alzheimer[8] (1911) reports an additional case of the type which he first described and of the same character as the group of cases reported by Perusini. The case is an example of "Alzheimer's disease" described in the 8th edition of Kraepelin's Clinical Psychiatry. The peculiar type of intracellular neurofibril degeneration, however, was not present. The general character of the plaques, ganglion cell and glia alteration are essentially such as characterize typical senile dementia. The inference to be drawn from cases of this character is: there exists a clinical state which may be designated as precocious senile dementia. Convincing illustrations are given of the histological composition of the plaques which relieve these structures of much of their former mystery. In this case plaques were found not only on the cerebrum, but in the cerebellum, medulla and cord as well.

III. Material Employed and Scope of the Present Study.

The brains of 33 elderly persons dying with psychoses chiefly of the senile type, small portions of brains from 6 elderly persons dying without psychosis and 50 younger subjects comprising a variety of mental diseases furnished the material for this paper. So far as warranted from the available material, an attempt has been made to determine the frequency of miliary plaques in brains of the aged, the clinical significance and the finer structure of these characteristic bodies. Further, there has been an effort to establish the fundamental histological differences, if any such exist, between plaque cases and other cases of the same general clinical and gross anatomical grouping in which no plaques were found.

The deductions noted at the end of this paper have been drawn chiefly from the study of the 33 elderly subjects dying insane. Material from elderly subjects without psychosis was limited; nevertheless, examination of the brain tissue at hand and a review of reported cases were essayed with the purpose of determining the extent to which the miliary plaques here considered are an accompaniment of old age—regardless of the existence or non-existence of psychosis. The study of material from elderly subjects, however, has been supplemented by a re-examination of a number of neurofibril slides on file at the pathological laboratory of Westborough State Hospital, undertaken with the hope of obtaining additional data to aid in a satisfactory solution of

the matters in question. The supplementary material—50 younger subjects noted above—includes cases of general paresis, formerly so-called involution melancholia, manic-depressive insanity, dementia præcox, luetic meningoencephalitis, tuberculous meningitis, purulent meningitis (streptococcus infection), brain tumor, chronic alcoholism, microcephalic idiocy, epileptic insanity and psychosis associated with diffuse degenerations of the spinal cord (Putnam type). Finally, there has been added a consideration of the nature of senile dementia, such as may be deduced from the general histopathological picture of the brains of persons dying from this form of mental disease, and a comparison of the histological lesions of the plaque and non-plaque material from elderly subjects with reference to their place in the general histological scheme of senile dementia.

All of the 33 cases of elderly persons dying insane, with 3 exceptions, 56, 59, 60 years of age respectively, were well within the period of senium. From the clinical data obtainable and in a certain sense from the anatomical findings as well, these cases fall readily into 3 chief groups: (a) senile dementia, including "simple senile dementia" and presbyophrenia, (b) arteriosclerotic dementia, with or without gross focal lesions, and (c) a group in which it is difficult to appraise clinical symptoms and anatomical findings. In some of the cases of the last group there is little doubt as to the presence of clinical and anatomical signs of senile involution, but whether or not these have been superimposed on changes which had their origin at a much earlier period during the life of the subjects, the writer is unable to determine.

The incidence of age is shown in the following table:

TABLE I.

Decade.	No. of Cases.
6th	3
7th	11
8th	10
9th	9
Total cases	33

IV. ANALYSIS OF GROSS ANATOMICAL FINDINGS WITH REFERENCE TO PLAQUES.

The material was first arranged in two groups, (a) atrophic brains, (b) normal-weight brains, and studied with reference to

the frequency with which atrophy and plaques were associated and the possible etiological relationship of brain wasting to the formation of plaques. The miliary plaques with which we are concerned were first reported in connection with cases of senile cerebral atrophy (*vide supra* Redlich and Blocq and Marinesco); it seemed well, therefore, to establish for this series the extent to which the presence of plaques was dependent upon, or only coincident with brain wasting.

Atrophic Brains.—Twenty-six cases in the series, 15 men and 11 women, presented atrophic brains. Eleven of the atrophic brains, 6 from males and 5 from females, exhibited plaques. But the 2 most atrophic brains in the entire series, 821.1 and 900.1 grams respectively, both from women, failed to show the characteristic miliary structures.

Normal-weight Brains.—Assuming 1358 grams as the normal average brain weight for men and 1235 as the normal average weight for women, 7 subjects, furnished brains well within the range of normal weights. It is well to note, however, that of the 7 normal-weight brains 4 exhibited focal atrophies, 2 of these in addition presenting multiple focal softenings and lacunæ. The remaining 3 cases of the group were without macroscopic evidence of atrophy. Five of the seven normal-weight brains, 4 men and 1 woman, yielded plaques in abundance. Of the 4 normal-weight brains with focal atrophies, 3 contained plaques.

While the conditions which make for atrophy may also be directly or indirectly responsible for plaques, it is obvious from this analysis that plaques cannot be predicated from atrophy alone. Forty-two and three-tenths per cent of the atrophic brains in the series and 57 per cent of the normal-weight brains exhibited plaques. A predisposition in favor of normal-weight brains, however, must not be assumed, for the reason that the cases are too few from which to draw such conclusions; furthermore, as will be shown later, plaques are probably dependent upon quite different factors.

A second grouping of the material was effected with the view of ascertaining the possible influence of coarse brain lesions in the production of plaques, lesions such as hæmorrhages into the brain substance and meninges, gross focal softenings, lacunæ, etc., resulting from arteriosclerotic cerebral vessels.

It has been shown that more than half of the brains which were well within the range of normal-weight presented focal lesions—atrophies, softenings and other evidence of cerebral arteriosclerosis. It has also been shown that atrophic as well as normal-weight brains may exhibit plaques. On the other hand, many brains in which, judging from gross anatomical findings and the clinical course as well, one might reasonably expect to find plaques, proved disappointing, while frequently some of the least suspected subjects were the most fruitful in their yield of the characteristic structures. Thus an attempt to establish, as it were, a type of brain at the autopsy table which would show plaques on microscopical examination has been most baffling. The following groups while not wholly satisfactory give some idea of the general gross condition of the brains in this series of cases in which plaques were found on microscopical examination:

(1) *Atrophy, Arteriosclerosis Without Focal Lesions.*—Ten brains constitute this group, 5 exhibiting plaques. Thus 31.2 per cent of all plaque cases were found in group 1.

(2) *Atrophy, Arteriosclerosis, Focal Lesions.*—Fifteen brains are included in this group, in 6 of which plaques were found. This group, then, furnished 37.5 per cent of the plaque cases.

(3) *Normal-weight Without Focal Lesions, Arteriosclerosis.*—Of the 2 brains so grouped, 1 or 6.25 per cent of the series showed plaques in abundance.

(4) *Normal-weight, Focal Lesions, Arteriosclerosis.*—This group contained 5 brains, 4 showing plaques. The percentage of all plaque cases coming from this group was 25.

5) *Atrophy Without Arteriosclerosis.*—One brain was so classed which, however, is open to question. An entire absence of arteriosclerosis cannot be maintained, for the basilar artery exhibited macroscopically a few atheromatous patches (possibly arteritis syphilitica of the Huebner type). The case offered clinically many features common to psychosis of the involution period and yet the histological lesions must be classed as a combination of chronic meningo-encephalitis with cerebral syphilis of the endothelial type (Alzheimer[21]), or the combined inflammatory and non-inflammatory form of cerebral lues (Nissl[22]). No plaques found.

Summarizing the results of the gross anatomical grouping of the material we find: (a) out of a total of 33 brains from elderly persons dying insane 16 or 48.48 per cent furnished plaques. (b) Ten or 62.5 per cent of the plaque brains exhibited gross focal lesions. (c) Fourteen or 87.5 per cent of plaque brains displayed macroscopically atrophy which was either diffuse or focalized in character. Instances of the combination of the two forms of atrophy were common.

Clinical abstracts and anatomical diagnoses of the cases presenting plaques are given in the succeeding section.

V. The Plaque Cases Among Elderly Subjects Dying Insane.

Clinical Abstracts of Plaque Cases.

Case I.—W. S. H., No. 8723, a retired farmer, 84 years of age, with a negative family history for nervous and mental disease, enjoyed general good health until the middle of his 83d year. About that time, mental and pronounced physical failure began to be apparent and for the 18 months prior to admission was steadily progressive. Financial losses seem to have played a rôle in the mental breakdown. Loss of weight, general asthenia, insomnia and memory defect were among the first troublesome symptoms. Memory became impaired so that even the grossest events, remote and recent, were recalled with difficulty or forgotten entirely. He could not recall the names of old associates and frequently forgot the names of those in his immediate family. The gaps in memory were often filled in with fabrications. In the two months preceding admission to hospital, periods of confusion had been noted; he roamed about the house in aimless manner and on one occasion attempted to move the lighted cook stove from one room to another. Other equally senseless and dangerous acts were attempted in the confused periods. He frequently talked aloud to himself and at such times the speech content was paraphasic or jargonic. He gave evidence of auditory hallucinations. There was a loss of bladder and rectal control which made it more difficult to care for him at home.

On admission to Westborough State Hospital, a markedly emaciated and feeble old man barely able to walk, whose gait was that of senile trepidant abasia presented. The heart sounds were feeble and irregular, no murmurs detected. Respirations 16 per minute, râles of all kinds heard over the chest. The skin was very dry and ashy in appearance, presenting recent bruises over shoulder and scalp.

Knee jerks absent (resistance?), elbow, wrist, pectoral and abdominal reflexes elicited, cremasteric absent. Left-sided Babinsky; no Oppenheim; no evidence of cranial nerve palsies or other paralyses. Examination for

sensory disturbances unsatisfactory, patient did not co-operate, but pain sense intact.

Mentally the patient took no notice of his surroundings. Although he attempted replies to questions his answers were irrelevant, incoherent and at times paraphasic. The emissive quality of speech was thick, low-pitched and attended with considerable motor difficulty. There was apparent mental confusion and quite a little psycho-motor unrest, all of which made the examination quite unsatisfactory.

The day following admission, the symptoms of a cerebral hæmorrhage suddenly developed: loss of consciousness, clonic spasms of the right side of face and right arm, followed by a right hemiplegia. Consciousness was not regained. A sub-normal temperature (94° F. rectal) was carried constantly until his death four days later.

Anatomical Diagnosis.—Increased density of calvarium, dural herniæ (invaginations of pia and Pacchionian granulations), pachymeningitis hæmorrhagica interna, chronic leptomeningitis, atrophy of cerebral gyri, advanced cerebral arteriosclerosis, granular ependymitis; cardiac displacement (heart placed at right angle to long axis of body), abnormally long ascending aorta (9 cm.), chronic endocarditis; chronic pleuritis; congestion and interstitial hepatitis; chronic perisplenitis and interstitial splenitis, chronic interstitial pancreatitis; gastritis; chronic interstitial nephritis; cystitis, enlarged prostate.

Case II.—W. S. H., No. 6753, a man 70 years of age suffered an attack of influenza two years ago up to which time he had always enjoyed good health. Syphilitic infection was denied. He had never used alcohol, had been successful in life as a jeweler and was considered above the average mentally. Following the attack of influenza he never regained his former strength; practically all this period he grew weaker, slept poorly and lost in weight. Impairment of memory was progressive and he was able to recall only the grossest events of the remote past. He had a tendency to wander away from home and could not find his way in previously familiar localities. There were periods of considerable motor restlessness, apprehension and excitement during which he gave expression to delusions of ill treatment on the part of his family. During periods of excitement he jumped from a window, assaulted his wife and daughter with a chair, tore bed clothing and was otherwise destructive. The patient's father died of apoplexy, but no other family history of importance elicited.

On admission, a poorly nourished old man presenting a general appearance of feebleness. There was a systolic murmur; respirations shallow, slight dullness in both apices. The skin was dry. Arcus senilis, peripheral arteriosclerosis and general tremor were present.

Neurological Examination.—Knee-jerks slightly increased; abdominal, cremasteric, elbow and wrist reflexes elicited. Slight swaying to Romberg. No paralyses of cranial nerves or other paralyses. No cutaneous sensory disturbances detected. Pupils react sluggishly to light and accommodation.

Mentally the patient was without grasp on his surroundings; he was disoriented for time and place, and showed a marked impairment of memory. He talked freely, but was rather prolix and thought his relatives had sent him to prison. He cried easily without any apparent adequate cause and exhibited a mild depression. No evidence of aphasic disturbances. No hallucinations determined.

The day following admission there was considerable motor restlessness and crying, a condition which persisted for three weeks when he developed a temperature of 103° F. (rectal). Restlessness increased and visual and auditory hallucinations developed. He became unconscious during the first day of the increased temperature and remained so for five days. Death.

Anatomical Diagnosis.—Chronic external pachymeningitis, atrophy of pia, hydrocephalus ex vacuo, focal atrophy of cerebral gyri, advanced cerebral arteriosclerosis, multiple focal softenings and lacunæ in corona radiata and basal ganglia; chronic interstitial hepatitis; chronic interstitial splenitis; chronic interstitial nephritis; acute enteritis.

Case III.—W. S. H., No. 8600, a man 72 years of age, concerning whom his immediate relatives could give no information as to his previous history since youth, except to state that for many years he had complained in letters sent home, of kidney disease and rupture. The patient was of a roving disposition, going from one place to another all over the country, remaining nowhere any length of time. Two paternal cousins are patients at this hospital.

In the latter part of July, 1909, the patient suffered an attack of ptomaine poisoning during which he was delirious. He was seemingly making a good recovery when on August 4, about ten days after the onset, he suddenly got out of bed, left his room and attempted to force an entrance into other rooms of the house where he was lodging. Unsuccessful in these attempts he finally jumped from a window and made his way to the street where he created a scene while being returned home. Immediately following this episode the patient was committed to the Boston State Hospital as an emergency case. On arrival at the hospital he was reported as presenting a weak and exhausted condition. For four days he was kept in bed and during this period was quite irritable and fault-finding and made many unreasonable demands. There does not appear to have been any clouding of consciousness. Six days after admission to Boston State Hospital his physical condition improved sufficiently to warrant his being up and dressed. Following this he was less fault-finding and on the whole quite cheerful. Transferred to Westborough State Hospital, September 22, 1909.

On admission, a poorly nourished old man who looked his age. Moderate use of alcohol was admitted, previous venereal diseases denied. The heart's action was weak and irregular and there was increased cardiac dullness; no murmurs detected. Pulmonary sounds not pathological. No lesions of other viscera noted. The skin was flabby, parchment-like and

except for head and eyebrows, entirely devoid of hair. Well-defined arcus senilis and marked peripheral arteriosclerosis presented.

Knee, wrist, elbow, pectoral, abdominal, cremasteric and plantar reflexes elicited. No Babinsky, no Oppenheim phenomena. Co-ordination tests fairly well executed, although there was a general tremor of the senile type. The tongue deviated to the right when protruded and there was slight swaying to Romberg. Pupils reacted promptly to light and accomodation. No sensory cutaneous disturbances detected.

Mentally the patient was mildly exhilarated, expressed ideas of self-importance and frequently assumed dramatic attitudes. He also gave expression to delusions of persecution, repeating frequently, "Wealth keeps me here." He insisted that he was drugged by the physician who attended him before he was sent to Boston State Hospital and in order to avoid a suit which he intended to bring against the doctor, the latter had him committed as an insane person. He was oriented for time and place. Memory was defective especially for recent events. He was rather garrulous and prolix. The above was much his condition throughout, memory defect increased all the while. April 6, 1910, seven months after admission, he complained of considerable pain in the cardiac region which grew worse until death, nine days later.

Anatomical Diagnosis.—Pachymeningitis hæmorrhagica interna, chronic leptomeningitis, cerebral arteriosclerosis; cardiac dilatation; emphysema; interstitial hepatitis; gastritis, enteritis; chronic interstitial nephritis.

Case IV.—W. S. H., No. 8939, a man 66 years of age without previous mental disease or any other serious illness, enjoyed good health until the age of 64. A moderate use of alcohol was admitted, syphilis denied. During a hot day two summers ago the patient went fishing. The greater part of the day was spent on the river fishing from a small boat. In the late afternoon after reaching the shore and while preparing to start for home he suddenly became very weak in the legs so that he could not walk without assistance and had to be practically carried by two men. At the same time his speech became affected—for the most part unintelligible—and with equal suddenness his vision was so impaired that it was very doubtful whether he could see at all. This attack was diagnosed a "sun stroke," for which he was accordingly treated. His son who was with him at the time and furnished the information states that, dating from this episode he rapidly failed physically, but the mental failure was gradual and only during the last two months had it been pronounced. Memory, which became impaired soon after his illness, was so deficient that at times he was unable to recall the names of his immediate relatives. There were periods of confusion in which he would wander about aimlessly. His gait became so impaired that he could not go without stumbling a great deal and falling frequently. When down the patient was too weak to rise without assistance. He was actively hallucinated (auditory), noisy and restless at night. For three weeks prior to admission there was loss of bladder and rectal control.

On admission, a fairly well nourished old man who looked considerably older than his reported age. When assisted he was able to walk, but unaided stumbled and fell easily. The gait was spastic. The senseless resistance which the patient offered to everything rendered the examination unsatisfactory, but an enlargement of the cardiac area was detected and the heart's action was weak and irregular. No pathological pulmonary sounds were noted, or gross lesion of the abdominal viscera. There were varicose veins of the lower extremities. Marked arcus senilis and peripheral arteriosclerosis. All tendon reflexes active. The pupils were unequal and reacted sluggishly to light, accommodation test unsatisfactory. There was a nystagmus of the left eyeball. A general tremor was present and considerable motor unrest.

Mentally the patient was disoriented, for the most part confused. During the short intervals when he seemed fairly clear he mistook the hospital personnel for old acquaintances. The speech was drawling and frequently unintelligible—a mere jargon. Many of the questions addressed to him were apparently not comprehended for instead of replying he often looked about in a bewildered manner. Stool and urine were passed involuntary. This was his condition throughout. A week after admission a lobar pneumonia developed from which the patient died.

Anatomical Diagnosis.—Chronic external pachymeningitis, chronic leptomeningitis, cerebral atrophy, advanced cerebral arteriosclerosis, no gross focal lesions of brain; marked cardiac hypertrophy (*cors bovis*), chronic endocarditis, chronic interstitial myocarditis, atheromatous degeneration of aorta, coronary and peripheral arteriosclerosis; pleuritis pulmonary congestion and œdema; hepatic congestion; moderate splenomegally, interstitial proliferation; interstitial pancreatitis; moderate interstitial nephritis.

Case V.—W. S. H., No. 8453, a woman 79 years of age, had suffered several attacks of serious illness during her life: typhoid fever at the age of 16, from her 30th to her 40th year, chronic gastritis, which gave much trouble, a second attack of typhoid with "brain fever" at 50, and when 51 an attack of insanity which lasted for 18 months. Following the attack of insanity there was recovery with defect, for she was never quite the same as before—absent-minded, disinclined to meet strangers, feared going out alone, easily excited and given to talking to herself. Nevertheless, it was possible to care for her at home without any inconvenience to the peace of the family. At the age of 74 memory defect began to be apparent and as this increased, the gaps in memory were quite regularly filled in with fabrications. Periods of confusion were frequent, contrary to her life-long disposition she became very irritable and developed the idea that she was being persecuted and otherwise ill-treated by her relatives. With advancing mental deterioration she frequently threatened violence, was noisy and restless at night, talked obscenely, complained of numerous paræsthesias, lost control of rectal and bladder functions, gave evidence of auditory, visual and tactile hallucinations and finally failed to recognize

the members of her household. No history of alcohol or of venereal disease. Family history negative.

On admission an extremely anæmic and emaciated, feeble, old woman who was unable to walk and presented a general senile tremor and a tumefaction of the left parotid gland. The heart's action was labored and intermittent and there was a harsh friction sound at the apex. General peripheral arteriosclerosis. Blood examination revealed Hb. 14, red cells 1,600,000. Respiratory sounds were harsh, no râles. Examination of urine showed the presence of hyaline and fine granular casts. Paralysis of bladder (necessary to catheterize) and rectal incontinence existed. Quite a little negativism was exhibited.

Both knee-jerks were increased and a questionable double Babinsky elicited. Other reflexes unsatisfactory. Left cornea opaque, right pupil reacted sluggishly to light, patient did not co-operate for accomodation test. Cutaneous pain sense intact. Patient complained of numerous paræsthesias of trunk and extremities (lower). Hearing in right ear good, in left greatly impaired.

Mentally the patient exhibited alternating periods of confusion with periods of a fair degree of clearness. She was completely disoriented and without insight. After two hours in the hospital she could not tell how long here or where she came from. She gave expression to delusions of persecution, believing she was drugged and annoyed constantly by enemies. Memory impairment for both remote and recent events was marked.

After a month in hospital, during which there were periods of stupor and somnolency alternating with periods of excitement, the patient seemed a little better mentally than when admitted. After two months in hospital a diarrhœa developed which so weakened the patient that death followed in a few days after its onset.

Anatomical Diagnosis.—Chronic external pachymeningitis, chronic leptomeningitis, hydrocephalus ex vacuo, atrophy of cerebral gyri, advanced cerebral arteriosclerosis, multiple cerebral lacunæ and softenings; chronic endocarditis, chronic aortitis, advanced atheromatosis of aorta, iliac vessels and peripheral arteries, interstitial myocarditis; hypostatic pneumonia, chronic pleuritis; chronic interstitial hepatitis; chronic interstitial nephritis.

Case VI.—W. S. H., No. 8892, a man 83 years of age sustained a Pott's fracture in a street railway accident twelve years ago, up to which time he had suffered no serious illness or previous injury of any moment. Since this street car accident he has steadily failed, physically as well as mentally. Ten years ago he passed through an attack of scarlet fever which left him deaf in the left ear. It was noted that his memory was poor soon after the accident and the impairment became extreme. During the past four years he was a great care to his family, showing a tendency to wander away from home in an aimless and confused manner. For two years he had frequent short periods of excitement at which times he threatened violence and on one occasion very nearly killed his aged wife by choking her. He was hard of hearing for some years and the deaf-

ness increased perceptibly. There were periods when he was extremely noisy, other times when he was given to weeping a good deal and occasions which his friends described as "stupid" were frequent. He was untidy and extremely garrulous, although the speech was at times very indistinct and unintelligible on account of motor difficulty with resulting defective pronunciation and also on account of its paraphasic or jargonic character.

On admission an obese, somewhat jaundiced and feeble old man who looked his age. He was unable to stand alone, but when supported could walk, although in a halting and extremely trepidant manner. There was an enlargement of the area of cardiac dullness, and a systolic murmur was heard over the whole of the præcordia, though best at the apex. Vesicular breathing and râles were heard over both lungs. Varicose veins of the lower extremities and peripheral arteriosclerosis were present. Arcus senilis. Sight was defective in both eyes (presbyopia), impairment of hearing in right ear and total deafness in left. Deep and superficial reflexes elicited, pupils reacted to light and accommodation. There was loss of bladder and rectal control.

Mental examination was difficult on account of the impairment in hearing, but it was ascertained that memory was defective, especially for recent events. Insight was superficial. There was a degree of depression and some apprehension when talking of home and family, but otherwise a mild euphoria existed.

The patient was in hospital for a period of five and a half months, during all of which time he grew worse. There were periods of irrascibility, mental confusion and occasionally fabrications to fill in memory gaps. Finally there was loss of cardiac compensation resulting in death.

Anatomical Diagnosis.—Increased density of calvarium, chronic hypertrophic leptomeningitis, internal and external hydrocephalus, advanced cerebral arteriosclerosis, atrophy of cerebral gyri; chronic endocarditis, chronic interstitial myocarditis; pleuritis, emphysema; chronic interstitial hepatitis; chronic interstitial splenitis; chronic interstitial nephritis; cystitis.

Case VII.—W. S. H., No. 8652, a man 89 years of age. Very meagre family and personal history was obtained from the overseer of the poor. Father of patient was reported to have been a hard drinker, he himself a moderate user of alcoholic stimulants. About a year prior to admission to hospital delusions were evidenced to those who knew him. About this time it was noted that his memory was very defective for remote as well as recent events, and that he frequently fabricated experiences. During the year he had grown steadily worse. He was often noisy and restless at night, extremely profane and obscene in his language, irritable, stubborn (negativism); he feared that his belongings would be stolen; he made indecent proposals to women and exposed his person in public.

On admission, a markedly emaciated old man, unkempt in appearance, presented a skin eruption due to scabies, a general senile tremor and senile trepidant abasia. Heart sounds accentuated, rapid, irregular, no

murmurs detected, area of cardiac dullness normal. Respiratory sounds were not pathological. No disturbances of reflexes that were of significance. Sight and hearing in fair preservation.

Mentally comprehension was good as evinced in the speech reactions. Disorientation for time and place. Memory was defective for recent events. The patient was irritated by the questions of examiner. He defecates and urinates in bed.

During hospital residence there was no improvement in his condition. He was noisy and irritable when not asleep. The patient, however, slept a great deal. Untidiness persisted. A dysentery developed soon after admission and persisted to the end, the patient dying on the twelfth day after admission.

Anatomical Diagnosis.—External pachymeningitis chronica, leptomeningitis chronica, cerebral atrophy, advanced cerebral arteriosclerosis; chronic endocarditis; pleuritis, septic pneumonitis; chronic interstitial hepatitis; chronic interstitial splenitis; gastritis; chronic interstitial nephritis.

Case VIII.—W. S. H., No. 8627, a man 60 years of age had suffered no serious illness until the present mental attack, which the family believed had its onset five years ago. At that time the announcement by telegram of the sudden death of a son from whom he expected a visit affected him greatly. After this event he seemed to have lost interest in things in general, was hard to please and kept to himself—conduct quite contrary to his former genial disposition and social habits. It was noticed, too, that, dating from his son's death, his speech utterances were slightly defective—often indistinct, difficulty in pronouncing many common words and in finding the proper word to employ. He also complained of numbness in the right arm, but the patient was able to continue at work as a machinist. Three months before admission to hospital he suffered a second "slight shock" which, however, did not incapacitate him for work. Finally, four days before admission, he returned home rather late from work, complaining that he could not see. Soon after arriving home he became unconscious, associated with which there was considerable restlessness and moaning as though in pain. The day following, consciousness was regained. At this time the patient had partial insight into his condition, but exhibited a degree of apprehension which perhaps was not excessive considering the gravity of his case. During the three days before admission he was quite restless and depressed, finally refusing food for fear of being poisoned. The father of the patient died from apoplexy.

On admission, a fairly well developed man, extremely nervous and haggard. He appeared considerably older than his reported age and walked with a spastic gait. Other than increased action and accentuation of the first sound, the heart offered nothing of special interest. There was, however, general peripheral arteriosclerosis. Lungs negative; kidneys, chronic interstitial nephritis (urinalysis). Other abdominal viscera negative.

The protruded tongue deviated to the left. The pupils reacted sluggishly to light and accomodation. Elbow, wrist, pectoral and abdominal reflexes active. Knee-jerks increased, especially the right and there was a right-sided Babinsky. Poor co-ordination of upper extremities, gait spastic, station unsteady.

Good orientation for place and persons, poor for time. Emotionally, the patient was unstable, crying a great deal without adequate cause. On the whole, mental processes were slow. Questions were comprehended slowly and there was a motor difficulty in getting out his words. Following admission the patient improved rapidly and in less than a month was permitted to leave the hospital. For a few weeks after leaving hospital he continued to do well, then he again grew irritable and fault-finding, showed a decided memory defect and failed physically. Four months after leaving hospital he was readmitted with all symptoms noted at first admission intensified. Nevertheless, there was considerable insight exhibited by patient and he admitted periods of confusion. Two weeks after return, cerebral insult occurred. Consciousness was not recovered, death four days later.

Anatomical Diagnosis. — Pachymeningitis hæmorrhagica interna, chronic hypertrophic leptomeningitis, advanced cerebral arteriosclerosis, recent hæmorrhage into the right optic thalmus, soft brain; cardiac hypertrophy; pulmonary hypostasis; hepatic congestion; chronic interstitial nephritis, cystic degeneration of kidneys.

Case IX.—W. S. H., No. 8633, a woman 81 years of age showed mental symptoms at the age of 78. She had had most of the children's diseases, including scarlatina at the age of 2. Menopause at 50 without special mental symptoms. Mother of patient was insane (senile dementia). At 78 memory defect was noted and later romancing was common. About this time she charged her husband, an old man, with dissolute living and developed the idea that neighbors were "down on her." These delusions increased rather than diminished, in consequence of which she frequently threatened violence. Auditory and visual hallucinations became so prominent that it was necessary to commit her.

On admission, an old woman, well developed and well preserved physically. She was, however, extremely resistive and would not submit to a physical examination, giving as a reason that she has been illegally sent to hospital and that there was nothing the matter with her. There was, however, evidence of peripheral arteriosclerosis. She admitted "voices" and charged enemies as being responsible for her presence here. She was very bitter against her husband. Comprehension good, orientation defective. School knowledge deficient and memory greatly impaired, especially for recent events.

The patient remained in hospital a year and 3 months, during which period she was for the most part sullen and irascible. She continued to show marked disturbances of memory and was frequently hallucinated. A week before death she met with an accident—a fall resulting in an

intracapsular fracture of the femur. The day before death, cerebral insult, followed by death within 24 hours.

Anatomical Diagnosis.—External pachymeningitis, pachymeningitis hæmorrhagica interna, general cerebral congestion, atrophy of cerebral gyri, advanced cerebral arteriosclerosis, no other gross focal lesions of brain; chronic endocarditis, general peripheral arteriosclerosis; pulmonary congestion and œdema; fatty liver; chronic interstitial nephritis; intra capsular fracture of head of femur.

Case X.—W. S. H., No. 4865, a man 71 years of age who previous to his mental breakdown had never suffered serious illness, began to show mental symptoms at the age of sixty-six. These were at first mild—an unaccustomed garrulity and memory defect which gradually increased in intensity. Later, auditory hallucinations appeared and he developed the idea that his relatives wished to poison him. Added to these there was loss of bladder and rectal control.

On admission, a fairly well-nourished old man presenting a general senile tremor and who walked in a halting and extremely trepidant manner. The heart's action was rather rapid and feeble. There was general peripheral arteriosclerosis. Lung examination revealed nothing of significance. A urinalysis showed the existence of chronic interstitial nephritis. The pupils reacted normally to light and accommodation and were circular and equal. Tendon reflexes sluggish. Cutaneous pain sensibility diminished.

Mentally the patient was dull and apparently indifferent to his surroundings. He comprehended slowly. Memory was defective for recent events, good for remote happenings. He expressed delusions of poisoning as noted above.

Following admission there was gradual improvement for a period of seven months when the patient suffered a cerebral insult. Although the shock did not prove fatal and was without motor residua (limb paralyses) the dementia which ensued was pronounced. Six months before death a second insult, followed by aphasic symptoms of a sensory type which, while not disappearing wholly, greatly improved. Three months before death a third insult with motor and sensory residua. Death three months later, suddenly, after a hospital residence of four years.

Anatomical Diagnosis.—Chronic leptomeningitis, advanced cerebral arteriosclerosis, cerebral atrophy, post-apoplectic softenings and cyst-like lacunæ in cortex and basal ganglia, destruction of T_1, left, head of caudate nucleus and greater portion of putamen on left side, heterotropia of lumbar and thoracic cord; cardiac hypertrophy, chronic endocarditis, chronic interstitial myocarditis; chronic interstitial nephritis.

Case XI.—W. S. H., No. 9252, a woman 77 years of age, of whom it is said she enjoyed good health up to two years ago. Her husband had died some years previous and she had been forced to work hard for support. Meanwhile, her remaining relatives, four sisters to whom she had been devoted also died which was the source of much grief and she never

seemed to quite reconcile herself to their death. At the age of seventy-five she was growing feeble physically and friends began to note that her memory was defective. Her chief interest seemed to be in the remote past, for she talked chiefly of associates long since dead. For several years she had been hard of hearing. As the memory defect progressed she frequently failed to recognize familiar faces. During the year prior to admission she was often restless and confused. She also showed a tendency to stray away and she developed the idea that she possessed a sum of money in a certain bank—an institution with which formerly she carried an account. During this period, speech disorder of a sensory type developed, her restlessness increased and she became so noisy that it was no longer possible to care for her at the home for the aged where she had been an inmate for about two years.

On admission, a fairly well-nourished, but rather feeble, old woman, who was extremely restless and talkative, exhibited besides a general tremor. Heart, lungs and other viscera offered no special pathological condition. Pupillary reaction sluggish. Tendon reflexes normal. Mentally the patient seemed quite confused. Although talkative, the speech content was irrelevant. When addressed she did not answer questions and it was difficult to determine whether the failure to react was due to deafness, inattention or to a sensory aphasia. A few days later she named several objects correctly. Usually, however, the speech content was absolutely irrelevant.

She suffered two attacks of catarrhal jaundice of a mild degree at an interval of a month between recovery from first and advent of second attack. Two months after admission, death from lobar pneumonia.

Anatomical Diagnosis.—Chronic external pachymeningitis, chronic leptomeningitis, general cerebral atrophy, cerebral asymmetry due to pronounced atrophy of left tempero-sphenoidal lobe, dilatation of posterior horn of lateral ventricle; chronic endocarditis, calcareous degeneration of coronaries, peripheral arteriosclerosis; pleuritis, lobar pneumonia; hepatic congestion; chronic perisplenitis, splenic congestion; gastritis; chronic interstitial nephritis.

Case XII.—W. S. H., No. 9364, a woman 79 years of age, mother of sixteen children, eleven of whom are living and well, had enjoyed good health, except for an attack of rheumatic fever at the age of forty, until five years ago when she received an accident—she fell striking the head. As a result she was unconscious for some time (length of time not stated) and was later delirious. From the immediate effects of the injury she apparently recovered, but soon afterwards her memory failed perceptibly and she grew steadily worse. She could not recall the names of life-long friends, but apparently remembered their faces. She began to sleep poorly, was usually restless and roamed about the house at night in an aimless manner. She talked a great deal, but the speech content was rambling and often incoherent. Contrary to her former mood she was very irrascible, she repeatedly threw objects at members of the family and on one occasion seized a knife with the intent to assault.

On admission, a fairly well-nourished old woman, quite restless, talkative and negativistic, presented a right facial paralysis and arthritis deformans of both hands. On account of the extreme restlessness and senseless resistance, a physical examination was unsatisfactory, but a mitral murmur, increased and irregular heart's action were detected. Respiratory sounds not pathological. Arcus senilis and peripheral arteriosclerosis. Pupils reacted to light and accomodation. Hearing was greatly impaired. Right knee-jerk increased on right side. No Babinsky elicited.

Mentally the patient appeared confused. Although she replied to questions, the speech content was seldom relevant. Despite the resistance, she was rather good-natured, laughing at the happenings about her. Later the patient was restless and noisy and roamed about the ward, frequently disturbing other patients.

Ten days after admission very somnolent, inequality of pupils, twitchings of extremities of the left side. Attacks of choking. Three weeks after admission, death.

Anatomical Diagnosis.—Increased density of calvarium, congestion and increased tension of dura, chronic leptomeningitis, external hydrocephalus, cerebral atrophy, advanced cerebral arteriosclerosis, comparatively recent hæmorrhages in left putamen, anterior limb of right internal capsule and in anterior portion of corona radiata on right side; cardiac hypertrophy; chronic adhesive pleuritis, pulmonary hypostasis; fatty liver; diffuse nephritis.

Case XIII.—W. S. H., No. 8032, a woman 87 years of age, had, until a year or more prior to admission, enjoyed good health and was a self-reliant and ambitious person. Nevertheless, she was more of less difficult to "get on with" because of her inflexible opinions. Relatives, therefore, had kept little in touch with her so there is no good account of the exact onset of the mental state. For more than a year she had been in poor health and this, together with financial losses and the recent death of an only daughter who had lived with her, seemed to have been potent factors as exciting cause for the outbreak of the psychosis. She became extremely garrulous and forgetful and showed a slight tendency to romance. She claimed to be without food in the house when there were ample provisions, and she felt that she was being ill treated by a certain man, who, on the contrary, was showing nothing but the greatest interest in her welfare.

On admission, a poorly nourished and feeble old woman exhibited an advanced state of peripheral arteriosclerosis. The heart's action was rapid and accentuated and there was a systolic murmur. Respiratory sounds were rather harsh. A urinalysis revealed a few hyaline casts and a small amount of sugar. Gait rather tottering; station unsteady. She did not co-operate in the neurological examination for the reason, as she stated, that she should not have been sent here. Hearing was greatly impaired; it was necessary to shout at the patient in order to be heard. Arcus senilis.

Mentally the patient comprehended when she could be made to hear. She was very noisy and was indignant to find herself in a hospital for the insane. She said she was deceived by those who brought her here. She was very prolix. No hallucinations.

The day following, she was quite exhilarated and attempted to give her fellow patients an exhibition of fancy dancing. Following the excitement she grew more reconciled to her stay. She remained in hospital two years and a half, exhibiting frequent alternations of periods of comparative comfort and cheerfulness and periods of slight depression and hypochondriasis, together with pains in the gastric region. Death from perforating gastric ulcer.

Anatomical Diagnosis.—External pachymeningitis chronica, chronic leptomeningitis, advanced cerebral arteriosclerosis, atrophy of cerebral gyri; cardiac hypertrophy, aortic stenosis, chronic interstitial myocarditis; pleuritis, pulmonary congestion; acute perihepatitis, chronic interstitial hepatitis; acute perisplenitis, chronic interstitial splenitis; gastritis, perforating gastric ulcer, acute fulminating peritonitis; chronic interstitial nephritis; general peripheral arteriosclerosis.

Case XIV.—W. S. H., No. 7103, a woman 84 years of age, concerning whose previous history little is known except that for four or five years prior to admission she had been failing mentally. During the year before coming to hospital her memory was so defective that she did not recognize old acquaintances, nor could she recall the name of a sister when shown her portrait. She wandered aimlessly about the streets, bought food which she allowed to spoil before attempting to use it and in a confused manner poured kerosene on the floor and in the cook stove. She would dress only in her night garments in which she would leave the house and she allowed herself to become very dirty, going it was claimed for more than a year without a bath.

On admission, a very unkempt, feeble and restless old woman, whose clothes were filthy and in tatters, presented every evidence of the lack of care. The heart offered no lesions, but there was a general peripheral arteriosclerosis. Respirations were shallow and broncho-vesicular in character. Urinalysis showed the presence of hyaline casts. The left pupil reacted sluggishly to light, the right normal. Both pupils reacted to accommodation. Knee-jerks not elicited. Romberg sign and a slightly ataxic gait were present.

Mentally the patient was not oriented. She was excited, restless, resistive and exhibited a marked impairment of memory for recent as well as remote events. It was doubtful whether or not the patient comprehended most of the questions asked her, whether this apparent lack of comprehension was due to impairment of hearing or to a sensory speech disturbance. She talked freely, but the speech content was more often irrelevent than not.

The patient was in hospital for four years and five months. At first she was more or less persistently noisy and restless, wandering about the

ward in aimless manner and frequently disturbing other patients by pulling at their beds. This condition lasted for little more than a month. Later she was quiet and tractable, usually remaining seated wherever placed. She had to be dressed and undressed and cared for in every way. Her speech content degenerated into a mere jargon and it was quite clear that comprehension was practically nil.

Anatomical Diagnosis.—Increased thickness and density of calvarium, external pachymeningitis, chronic hypertrophic leptomeningitis, external and internal hydrocephalus, cerebral atrophy particularly pronounced of tempero-sphenoidal lobes and asymmetry due to the marked atrophy of left tempero-sphenoidal, advanced cerebral arteriosclerosis; pleuritis, lobar pneumonia; chronic interstitial hepatitis; chronic interstitial splenitis; chronic interstitial nephritis with cystic degeneration.

Case XV.—W. S. H., No. 9378, a man 56 years of age had shown a memory defect for some time, but was able to continue at his work as a laborer on a farm where he had worked many years. About ten days prior to admission he suffered an attack of influenza with which marked mental symptoms were associated. He was very restless at night, roaming about the house, talking of his work and imagining he was doing it, going through certain movements employed in farming. Finally he began to destroy his clothing; he was disoriented, confused, apparently forgot the movements employed in dressing and feeding himself and lost control of bladder and rectal functions. Patient's mother died at the age of sixty-one from apoplexy.

On admission, a man in fairly well-nourished condition who looked considerably older than his stated age and presented in his person the appearance of neglect. His gait was wavering and unsteady, but not characteristic of anything more than general weakness. A systolic murmur, best heard at the apex, a full regular pulse and peripheral arteriosclerosis were present. Respirations were shallow and save over the superior lobe of right lung, broncho-vesicular in character. The pupils were slightly irregular in outline, but equal, reacting sluggishly to light. No co-operation for accommodation. Patient did not co-operate in tests for hearing and for same reason test for smell, taste and touch were negative. There were no paralyses or contractures. Tendon reflexes increased.

On the day of admission he was very somnolent, and could be aroused only with difficulty. He was dull and apparently indifferent to his surroundings. His speech reactions were slow, data frequently incorrect, often a logoclonic repetition of the last syllable of a word and with increasing fatigue, paraphasic. Some verbal amnesia was shown. He was disoriented, showed marked defect of memory and was entirely without grasp on his surroundings. The following day he was brighter mentally and for a while answered questions readily and in an orderly manner, although he was disoriented and memory defect was apparent. He fatigued easily and the emissive quality of speech became thick and un-

intelligible and with it a paraphasia was associated. A week later he became very noisy and restless and was confused most of the time, remaining so until his death on the twelfth day after admission.

Anatomical Diagnosis.—External pachymeningitis, herniæ of Pacchyonian granulations through dura, chronic hypertrophic leptomeningitis, atrophy of cerebral gyri, advanced cerebral arteriosclerosis; chronic endocardial thickening; bronchopneumonia; chronic perihepatitis; chronic perisplenitis.

Case XVI.—W. S. H., No. 9249, a man 67 years of age. When sixty-five began to show a loss of memory up to which time his general health had been good. He had been temperate in his habits and industrious. For two years he was very forgetful, at times acting as though confused and was often incoherent in speech. During the two months prior to admission the mental changes were more rapid in progress; he was often untidy, noisy and restless, and had the idea that he was being pursued by some one who wished to harm him.

On admission, a fairly well-developed old man who appeared anæmic, presented a rough, dry and scrawny appearance of the skin, a systolic murmur of the heart, general peripheral arteriosclerosis and moist, diffuse râles over the lungs. Pupils reacted to light and accommodation; patient did not co-operate in tests for hearing, taste and tactile sense integrity. The gait was unsteady, trepidant; muscular development and tone good. No paralyses, no contractures, but a general tremor. Tendon reflexes elicited, not pathological.

Mentally the patient was disoriented and apparently confused; at times he gave expression to fears, saying that he was pursued and in consequence was somewhat agitated. His speech content was prolix, often incoherent. The next day he fabricated experiences, was restless and talked as though replying to voices. He was in hospital four months and sixteen days, during which time he was often confused, talkative and untidy. A week before death a small abscess formed on the dorsum of the right foot and about the same time a lobar pneumonia developed from which he died on the seventh day after its onset.

Anatomical Diagnosis.—Moderate cerebral atrophy, moderate cerebral arteriosclerosis; acute degeneration of myocardium; lobar pneumonia; hepatic congestion; splenic congestion; diffuse nephritis.

Analysis of Clinical Histories with Reference to Classification.

An analysis of the histories of these 16 cases with reference to clinical classification and evaluation of the associated gross and histopathological lesions offers many difficulties. Although 62.5 per cent exhibited gross focal lesions of arteriosclerotic origin, these coarse brain lesions must be considered as incidental, in so far as direct relationship with plaques is concerned. In the

succeeding group of cases which presented no plaques gross focal lesions of arteriosclerotic origin were even more pronounced. The great majority of the plaque cases on their clinical side and all save one from anatomical considerations, must be classed with the severe form of senile dementia. If one takes the symptom-complex characteristic of presbyophrenia—confabulation, marked impairment of memory, faulty reproduction, disturbance of judgment and mental confusion—then three of the cases, all other things considered, may be readily classed as presbyophrenia. Dupré and Charpentier [33] have maintained that the symptom of confabulation with the associated memory defect so prominent in presbyophrenia is to be interpreted as evidence of a polyneuritis "affecting particularly the lower extremities. . . . . an acute polyneuritis with Korsakow's syndrome later evolving into chronicity." Nouët,[34] and Nouët and Halberstadt [35] do not share this view. They call attention to points of similarity as well as to points of difference in the two affections, laying especial stress on age, sex, facial expression, garrulity, euphoria, mental confusion and amnesia. Disturbance of consciousness and amnesia, they claim, are more profound in presbyophrenia than in polyneuritic psychosis. In the cases considered as prebyophrenia in this series, alcoholism can be eliminated; but the possibility of a former neuritis, although no history of such was elicited, cannot be entirely excluded. Hammel [36] states that the presbyophrenic symptom-complex may appear as a transitory syndrome in the course of "simple senile dementia," a view which the writer's experience favors. Cases II, VI, X and XII, on the whole, presented clinically symptoms which best comport with "simple senile dementia," although II and X showed at autopsy multiple gross focal lesions. Case VIII suffered repeated cerebral insults during a period of 5 years, motor residua and speech disturbance resulting. There had been transitory periods of confusion of which the patient was aware, but no considerable dementia, and throughout he possessed fair insight into his condition. He was of an apoplectic family, his father having died from cerebral insult. Ordinarily the case would be unhesitatingly classed as organic dementia of arteriosclerotic origin. And yet, if we are to consider plaques as evidence of senile dementia, or more properly speaking as an index of senile involution, is this an instance of precocious

senility? At any rate, the case falls short of a paradigm for "Alzheimer's disease." More nearly the type described by Alzheimer and Perusini is Case XV, a man who for some time previous had shown mental symptoms characterized chiefly by memory defect and a steadily progressive dementia. During an acute exacerbation, which supervened an attack of influenza, marked mental confusion, ideational apraxia and speech disturbance of a sensory character were present. At the autopsy the brain was within the range of so-called normal-weight, but there was atrophy of convolutions and gaping sulci in frontal and left tempero-sphenoidal lobes, thickening and opacity of the pia over mesial surfaces of frontal lobes, frontal and parietal convexity and superior surface of cerebellum. The blood vessels were extremely tortuous and sclerotic with numerous atheromatous patches which imparted a beaded effect. No gross lesions such as hæmorrhage, softening or lacunæ were found anywhere. Microscopically there was no evidence of Lissauer's paralysis, ordinary general paresis or the lesions of arteriosclerotic insanity made familiar by Alzheimer,[27] Binswanger,[28] Barrett[29] and others, but on every hand the general histological lesions such as characterize the severe forms of senile dementia were encountered.

Case III perhaps was always an abnormal person. During recovery from an attack of ptomaine poisoning a psychosis developed. The ptomaine poisoning and cardio-vascular disease from which he suffered must be considered as possible exciting cause for the psychosis, still the mental symptoms and anatomical findings bore something of the involution stamp. The mental symptoms in Case IV were of comparatively slow development, but certain rapidly developing sensory and motor symptoms immediately supervening a supposed "sun stroke," and in part persisting to the end, were not adequately accounted for in coarse focal lesions. Cases IX and XIV presented clinically marked intellectual deficit, confusion and symptoms of Wernicke's aphasia and showed anatomically pronounced focalized atrophy of the left tempero-sphenoidal lobe in one case and both tempero-sphenoidal lobes in the other, atrophies which were not accounted for by previous hæmorrhage, tumor and the like. Both brains could be considered as examples of the "partial cerebral atrophy" to which Pick[30,31] and Rosenfeld[32] have called attention in published cases.

Grouping the cases according to the scheme outlined by Wallenberg,[a] who recognizes two chief groups of senile dementia,—the first including cases with simple enfeeblement of intellect, the second, of which presbyophrenia is a sub-group, having delirium and hallucinations,—all of the cases, then, with exception of VIII, would fall into the second category.

Since none of the 16 brains were without evidence of arteriosclerosis and 3 were without the macroscopic signs of atrophy, the question of the relationship of atrophy to arteriosclerosis and the further question of the relationship of senile dementia to brain wasting arises.

Age Incidence.—The age incidence of the plaque cases by decade is shown in the following table:

TABLE II.

Decade.	No. of Cases.
6th	1
7th	3
8th	6
9th	6
Total cases	16

VI. THE CASES WITHOUT PLAQUES AMONG ELDERLY SUBJECTS DYING INSANE.

Clinical Abstracts.

CASE XVII.—W. S. H., No. 9221, spinster, 79 years of age, suffered a cerebral insult when sixty-one with resulting left hemiplegia. Since this time, at intervals of about two weeks, there had been periods of unconsciousness of from fifteen to thirty minutes duration. During the unconscius periods, stertorous breathing and muscular twitchings were present. At times the attacks were more in the nature of delirium—mental confusion and noisiness with considerable profanity. She slept little. Speech content was not aphasic in character, but she was prolix, often incoherent, and expressed delusions of ill-treatment on the part of relatives, who in reality were extremely devoted. During this time she complained of the sun shining on her constantly, and wished to be tucked firmly in bed for fear of falling out. Ever since the shock, however, there had been a feeling of insecurity against falls. Father of patient died of apoplexy at the age of sixty-one; five maternal cousins were insane.

On admission, ancient left hemiplegia with contractures, left facial paralysis, peripherial arteriosclerosis, arcus senilis, total blindness, al-

though patient insisted that she could see. When objects were placed before her to name she had to pass her hand over them first before she could tell what they were, but she usually named them correctly. The record of Dr. David W. Wells, patient's former oculist, for October 25, 1909, reads: "Cataract of anterior capsule in right eye, but can read medium-sized type. Left eye examined under mydriasis, lens clear. March 6, 1907. In right eye vision still .3 and with left eye was able to read nonpareil type. I doubt serious anatomical defect of left eye." She comprehended well, but was talkative and noisy and complained of abuse on the part of the hospital personnel. The tenth day after admission, patient was quiet and dull and had a temperature of 99.6° F. The next day considerable difficulty in swallowing developed, the face was flushed, she groaned frequently and was aroused with difficulty. Death.

Anatomical Diagnosis.—Increased density of calvarium, external chronic pachymeningitis, internal pachymeningitis hæmorrhagica interna (recent), chronic hypertrophic leptomeningitis, marked cerebral hemiatrophy as result of ancient destructive lesion of right insula, portions of putamen and globus palidus, anterior half of T_1, the supramarginal and angular gyri, atrophy of the right tegmentum, right half of pons, yellowish softening of left occipital lobe involving calcarine region. Advanced cerebral arteriosclerosis, sclerosis of left cross pyramidal tract of cord; endocarditis, chronic interstitial myocarditis; pulmonary congestion, bronchitis; moderate interstitial hepatitis; chronic interstitial nephritis.

Case XVIII.—W. S. H., No. 8699, a man 67 years of age, book-keeper, a year previous to his admission to hospital had what is said to have been an apoplexy, which, however, was without motor residua in the way of paralyses—there was vomiting of a cerebral type, dizziness, double vision, unsteadiness on his feet and a somewhat staggering gait. Diplopia persisted for several weeks; the staggering gait did not improve. He lost his former interest in things and would talk but little on subjects which did not pertain to his condition. For a few months immediately preceding admission to hospital he became suspicious of persons who came to visit him, frequently asking callers if they thought he was improving and any failure to reply promptly in the affirmative would be interpreted as a desire on the part of the visitors to find out all they could about his affairs. He would stop acquaintances, as well as strangers, on the street to ask if they thought he was improving. Frequently he remained quiet for a long period as though in deep thought apparently oblivious to his surroundings. His memory for the little daily happenings was very defective, but for remote events good. Two days before admission he was found during a heavy rain storm at the back door of a neighbor's house, unable to give his name, address, or utter an intelligible sentence. When taken home he sat in a chair disinclined to move, was resistive, threatening in his attitude, apparently suspicious, swearing and calling to physician, "get out," "aint it a shame." Next day he was quiet and made no attempt to talk except when questioned and then his replies were paraphasic. Two brothers of patient were insane.

On admission, a fairly well-nourished old man who looked his age. The first sound of the heart was accentuated, no murmurs, respiratory sounds were normal, double inguinal hernia, peripheral arteriosclerosis, arcus senilis. Pupils unequal, right larger, both reacting sluggishly to light and accommodation. Swaying to Romberg, gait somewhat staggering and trepidant. Knee-jerks plus on both sides, Oppenheim and Babinsky phenomena elicited. Hearing good. Integrity of taste sense could not be determined, likwise ability for fine tactile discrimination. The aphasia which presented rendered judgment of mental state difficult, but patient appeared at times confused, at other times good natured. The aphasia was of the sensory type for sometimes there was almost a logorrhœa, although paraphasic in character (verbal and literal) and frequently there was a verbal amnesia. He recognized objects placed before him and indicated their uses, although he seldom named them correctly. When fresh, the word sense of simple language (*notion du mot*) was fair, but the patient fatigued easily and then it was bad. Somatic orientation was very imperfect even when the patient was fresh. There was agraphia for dictation as well as for copy, and alexia. *Reihen Sprechen*, even for numerals, was very poor. Perseveration was marked. Although movements of the upper extremities were carried out somewhat clumsily there was no motor apraxia in the sense of Liepmann. At times he was very conscious of his defects which disturbed him exceedingly and was greatly pleased with his successes, but the quickness with which he fatigued always rendered aphasic examinations unsatisfactory. The patient was in hospital a year and grew worse constantly, the speech content degenerating into jargon and incoherent paraphasic attempts at expression.

Anatomical Diagnosis.—Increased density of calvarium, chronic external pachymeningitis, internal pachymeningitis hæmorrhagica, chronic leptomeningitis, cerebral atrophy, advanced cerebral arteriosclerosis, focal destruction by hæmorrhage (ancient) of left supramarginal gyrus, small old hæmorrhage in inferior portion of foot of posterior central gyrus, granular ependymitis, chronic endocarditis, aortitis, brown atrophy of heart; chronic interstitial hepatitis; chronic interstitial nephritis; enlarged prostate.

Case XIX.—W. S. H., No. 7900, a man 67 years of age, a broker, began to show mental symptoms when sixty-three. He returned from a successful business trip to a neighboring state, where he had gone a few days before, apparently very tired. He went to bed and was said to have slept for almost two days after which he appeared quite dull. He, however, continued his usual work but seemed to take no interest in it. This was in June, 1907. Despite his lack of interest he continued at work until the autumn when he took a trip with his family to the Pacific Coast. While in the west he spent a great deal of money recklessly and had numerous wild schemes for going into business. At this time his mood alternated between periods of dullness and periods of excitement in which latter he was talkative and irritable, at times threatening the lives of

members of his family. He also entertained vague fears of impending catastrophe to some one of his family, particularly his son. Since the episode in June, 1907, there had gradually developed a speech defect, first noted in an inability to recall many words employed in ordinary conversation and by the time of admission to hospital a year later, he was markedly aphasic (paraphasia, verbal and literal, literal agraphia, inability to comprehend complex sentences of ordinary conversation, alexia, though not complete, inability to repeat from memory, etc.). Contrary to his formery habit he became very slovenly in his personal appearance, ate his meals in a disgusting manner, used his boots for a urinal, threw lighted matches about the house after lighting his pipe and committed other acts of a similar nature which made it unsafe and impracticable to care for him at home. The patient had always used alcohol (daily), though it was claimed, not excessively, otherwise his habits were good and he had been a hard worker. An aunt of the patient was insane.

On admission, a small but fairly nourished man who looked older than his reported age, somewhat untidy in appearance, with a general expression of good nature, presented a right facial paralysis, a more or less fine general tremor and exhibited a peripheral arteriosclerosis. There was an enlargement of the area of cardiac dullness, accentuation of the second sound of heart, no murmurs. Urinalysis revealed a chronic interstitial nephritis; other trunk organs without special interest. The pupils were contracted, reacted to accommodation, the right very sluggishly to light, the left stiff. Station and gait good. Deviation of tongue to left. Tendon reflexes active. No Babinsky.

Mentally the patient appeared confused, restless and wandered about the ward in an aimless manner. His speech affection rendered difficult a good mental examination.

The patient was in hospital two years and six months. He made no improvement, suffered two cerebral insults in the course of his hospital residence. Speech utterances degenerated into jargonic paraphasia, there was entire loss of the word sense with complete agraphia and alexia, inability to name objects and recognize their uses and to repeat words after examiner.

Anatomical Diagnosis.—Increased density of calvarium, congestion of dura, chronic leptomeningitis, advanced cerebral arteriosclerosis, cerebral hemiatrophy (slight), old lacuna involving putamen anteriorly, internal capsule, external capsule and some of the fibers of the insula, together with numerous small lacunæ and small old hæmorrhagic areas in white substance and basal ganglia on both sides; chronic endocarditis, aortitis, degeneration of myocardium; chronic interstitial hepatitis; chronic interstitial splenitis; chronic interstitial nephritis.

Case XX.—W. S. H., No. 8287, a nurse, 61 years of age, enjoyed good health until about a year ago. About this time she had a fall in a street of the shopping district of Boston, the result of tripping against a curb stone. The day following there was a bloody discharge from the left ear

and blood-streaked expectoration. She was ill for a few days as the result of the fall, but the illness was without serious consequence for she was able to continue nursing. Eight months later she undertook the care of an hysterical patient, a friend of hers, continuing the case until the death of her patient a year later. She felt keenly her friend's death and began to worry quite a little. Two weeks later she began to have attacks of dizziness, her feet felt as though they were getting smaller and two months later a numbness in the right half of the face developed and in the corresponding half of the tongue there was a sensation as though the member had been seared with a hot iron. When she brushed her teeth they felt like a board. She drooled occasionally, bit the inside of her cheek without knowing it and vomited a great deal. About this time she complained much of failing vision and visited several oculists for treatment. A month later she began to have considerable difficulty in walking; she was frequently forced to support herself against the walls of the room or pieces of furniture to prevent falling. Everything in the room seemed to be going round, consequently her gait was staggering in character. The condition grew worse so it was necessary to take to bed. Two months later it was noticed by friends that she fed herself in an awkward manner. She developed delusions that the food was "doped" and she was greatly depressed over her health. A month later she became delirious and excited, and a speech defect developed which from the description obtained, must have been a temporary verbal amnesia. No history of mental disease in the family, but the mother of patient was a nervous woman who worried over trifles. The patient herself was active and industrious, but given to the formation of pretentious plans which she never carried out.

On admission, a feeble, poorly nourished old woman, unable to walk without support, presented. The heart's action was rapid, no murmurs, blood pressure 144 mm. Hg., peripheral arteriosclerosis, chronic gastritis and a rectal prolapse presented. The pupils were equal and reacted to light and accommodation, but there was a clouding of both cystaline lenses. The protruded tongue deviated sharply to the left and the right half was anæsthetic. The upper and lower extremities could be moved freely, although with the right hand finer movements were awkwardly executed. There was no difference in the hand grasps, both good. The patient could not walk unsupported on account of vertigo, all attempts to do so resulted in staggering and falling to the right. Tendon reflexes were active. Marked Romberg; no Babinsky, no Oppenheim. Speech utterances were slow, indistinct and thick in character. She comprehended all that was said to her and her replies to questions were relevant.

Mentally she was depressed over her condition, was generally nervous and admitted that she worried. Five days after admission, considerable moaning and groaning and projectile vomiting. A month later loss of rectal and bladder control, persistent nausea and vomiting. She was confused and often incoherent. When clear, a marked memory defect. Four

months after admission, cerebellar attitude—she lay in bed with head extended and there was a degree of opisthotonos. The head was turned to the right and attempts at flexion or turning in the opposite direction caused great pain. Horizontal nystagmus and considerable somnolency were present. Memory defect increased. She frequently said to nurse or physician, "I can see only half of you." The cerebellar attitude became more pronounced, the patient grew worse, finally dying after a hospital residence of three months.

Anatomical Diagnosis.—Increased density of calvarium, congestion of dura, chronic leptomeningitis, atrophy and flattening of cerebral gyri, atrophy and marked softening of right cerebellar hemisphere as the result of hæmorrhage, congestion of cord, osteomata of spinal pia; chronic endocarditis; pleuritis, broncho-pneumonia; congestion and fatty infiltration of liver; splenic congestion; gastro-enteritis; moderate interstitial nephritis; moderate interstitial pancreatitis; senile involution of reproductive organs.

Case XXI.—W. S. H., No. 6589, a man 71 years of age, who, although always of a nervous and excitable temperament, had enjoyed reasonably good health until the age of sixty-three. At this age he had what was described by friends as an attack of "nervous prostration," following a long period of hard work and some worry over his affairs. He did not improve but grew worse from year to year. Formerly, a man neat in his personal appearance, of good habits and circumspect in morals, he became careless in dress, extremely untidy in his habits and morally unendurable. He annoyed people by long calls at their houses or business places, engaging, particularly the women, in interminable conversation. He would stop women, entire strangers, on the street, inquire as to the number of their children, put his hands on them, remark on their physical development and offer indecent proposals. The same he did to girls as young as twelve years. Frequently he went about the house nude and would make his appearance in this manner when visitors were present. He was often irascible, destroying furniture and lighting fixtures whenever he felt they were in his way. On two occasions he had handled his wife violently and kept a piece of iron pipe in his bed-room to defend himself against burglars and other intruders. He would sleep on the floor instead of on a bed, and order the light on the piazza to be kept burning all night "to light the weary traveler on his way" when there was a street lamp opposite his house. He insisted on undressing his wife at night and anointing her with crude petroleum, etc., and maintained that his near neighbor was the vice-president of the United States. He was improvident with money, often throwing pennies away, yet complaining that relatives were not aiding him with funds to supply his needs. At rare intervals he was quite rational and orderly. He was often untidy about the house, using the sink as a urinal, etc. His mother was considered an eccentric; a sister likewise. A nephew is an epileptic.

On admission, a well-developed, well-nourished old man who looked older than his reported age, presented a marked senile trepidant abasia, peripheral arteriosclerosis, increased heart's action and a chronic interstitial nephritis as shown by urinalysis. Vision defective, opacity of both lenses, pupillary reaction sluggish to light and accommodation. Hearing defective, most marked in left ear. Smell, taste and tactile sensations apparently unimpaired. Tendon reflexes active. No Babinsky.

Mentally the patient was oriented, memory for important events in his life. No insight, saw no good reason for sending him to hospital, but thought he knew who was responsible. He comprehended what was said to him, talked freely but was very prolix. He cried easily without apparent good cause and his general mental attitude was very childish. Later he showed a tendency to disturb the ward by loud talking during the night. He had several dizzy attacks accompanied with nausea, but these were never associated with loss of consciousness. He wrote many incoherent letters and frequently had attacks of unprovoked laughter or crying. Eleven months after admission, while on his feet one day, he suddenly became dizzy and unsteady. He called out for assistance saying he did not dare to move, following which he was much confused. He would frequently leave his bed to wander about the ward in an aimless manner. After this attack memory deteriorated rapidly, particularly for recent events. There were frequent periods of untidiness. He failed gradually but constantly, finally dying twenty months after admission to hospital.

Anatomical Diagnosis.—Thickened calvarium, adherent dura, congestion of meninges, general pial opacity, congestion of brain, atrophy of cerebral and cerebellar convolutions, arteriosclerosis of cerebral vessels; congestion and atrophy of cord; thickening of mitral cusps, interstitial myocarditis, atheroma of aorta and coronaries; hypostatic congestion of lungs; congestion and interstitial splenitis; chronic interstitial nephritis; gastritis; decubitus of buttocks, trochanters and left interior malleolus; diverticula of bladder.

Case XXII.—W. S. H., No. 8516, a woman, widowed, formerly a nurse, said to have enjoyed good health until the age of 75, at which time she began to show decided memory defect, general fussiness and physical feebleness which precluded earning a livelihood by her own efforts as formerly. Without funds and owing to increasing physical and mental feebleness, she had been supported for more than a year from certain charitable funds. In the year prior to admission memory defect had grown very pronounced; there were periods of confusion and she had shown a tendency to stray away. Once she left her boarding house and was gone over night and when returned the next day, after having been picked up on the street, her head was cut and bruised and she could give no account of the injury. She shifted her boarding house several times, finding it difficult to get on with landladies. While at her last boarding place she imagined that the young men lodging in the house were in love with her

and on one occasion attempted to get in bed with one of them who had treated her kindly and befriended her in many little ways.

Family history as obtained is meagre and unimportant.

On admission, a feeble old woman, poorly nourished, presenting marked peripheral arteriosclerosis, a deformity of the left wrist (improperly united fracture), numerous cloasmæ on face and hands, senile trepidant abasia, general senile tremor, a systolic cardiac murmur, defective sight and hearing, and impairment of the sense of smell. The pupils reacted promptly to light and accommodation; arcus senilis; tendon reflexes active.

Mentally she presented a good-natured indifference to her surroundings, was faultily oriented, and had defective memory for important events, remote and recent. She immediately adapted herself to ward surroundings and except for occasional untidiness and a general senile fussiness was quiet and gave no trouble.

Patient was in hospital for a year, during which time she suffered several attacks of diarrhœa which weakened her. All the while she grew more childish and memory defect increased. Finally, difficulty in swallowing developed during an attack of broncho-pneumonia. Temperature rose to 105° F., the heart's action gradually weakened. Death.

Anatomical Diagnosis.—Increased density of calvarium, pachymeningitis externa, leptomeningitis chronica, cerebral atrophy and asymmetry of moderate degree, advanced cerebral arteriosclerosis; endocarditis, aortitis; pleuritis, pulmonary congestion, broncho-pneumonia; hepatic congestion; splenic congestion; focal congestion of gut; chronic interstitial nephritis, uterine fibroma.

(Multiple old lacunæ (int. cap. left), basal gang. and corona.)

Case XXIII.—W. S. H., No. 8306, a woman 73 years of age, began to have attacks of dizziness at the age of 71 which increased in frequency. Her memory for the two years preceding admission to hospital was decidedly defective, especially for recent happenings. She had often appeared depressed and suffered considerably from insomnia. She gave as a reason why she could not sleep that the parties held at the house late into the night (hallucinations) had kept her awake. She was depressed because of the recently acquired intemperate habits of her son (delusion). She was occasionally confused and talkative, the speech content rambling and incoherent.

On admission, an emaciated feeble old woman, who looked older than her reported age, presented general coarse tremors, marked peripheral arteriosclerosis, rapid and irregular heart's action. The pupils were dilated and reacted promptly. The hearing was greatly impaired. Knee-jerks were active, other tendon reflexes sluggish, gait unsteady and extremely trepidant.

Mentally the patient was disoriented, showed a marked memory defect for recent happenings, was without insight, claimed that people had intentionally annoyed her. She seemed surprised when told that the hospital was an institution for the care of the insane, replying "I must leave im-

mediately, I am not insane. How could my nephew do this? I have done so much for him," emotionally disturbed meanwhile. She admitted auditory hallucinations.

A month later loss of bladder and rectal control and increased memory defect. Although claiming to have been abused by the hospital personnel there was for the most part a good-natured indifference to her surroundings. Two months after admission (during summer) diarrhœa with great prostration. Recovery. Eleven days later sudden development of difficult deglutition, weak heart's action, death.

Anatomical Diagnosis.—Chronic leptomeningitis, atrophy of cerebral gyri, cerebral arterio sclerosis; moderate cardiac atrophy, atheromatous thickening of endocardium; pleuritis, hypostasis; Glissonitis; moderate interstitial splenitis; moderate interstitial change of kidneys, extensive decubitus over sacrum and buttocks.

Case XXIV.—W. S. H., No. 8751, a man 75 years of age, concerning whose previous history nothing is known, died after three days in hospital.

On admission, an emaciated, very feeble old man unable to walk (weakness) presented extensive trophic skin lesions over the right deltoid, lower portion of back and gluteal region. The heart's action was weak, arythmic, sounds muffled. Fair pulmonary resonance, but râles were present. Pupils reacted to light; patient did not co-operate in accommodation tests. Opacity of crystaline lenses, arcus senilis. All tendon reflexes weak. No Babinski.

Mentally the patient presented alternating periods of confusion and clearness. He was disoriented and memory was very defective, a condition into which the patient had some insight for he often offered excuses for his poor memory on the ground of age. He slept a great deal and when awake paid practically no attention to his surroundings. When admitted there was a diarrhœa which persisted to the end.

Anatomical Diagnosis.—Increased density of calvarium, external pachymeningitis, hydrocephalus interna et externa, cerebral arteriosclerosis, multiple old punctate hæmorrhagic areas in head of caudate nucleus and pons, moderate cerebral atrophy; parenchymatous degeneration of myocardium, peripheral arteriosclerosis; chronic pleuritis; gastritis, entero-colitis; chronic interstitial nephritis with cystic degeneration of kidneys, multiple and extensive trophic lesions of skin.

Case XXV.—W. S. H., No. 8589, a man, retired farmer, 85 years of age had enjoyed general good health until about his 80th year. He had given up active work and was beginning to be feeble, his sight was poor and memory defect was noted, all of which have increased in the intervening years. Although he had shown a tendency to stray away and at times mixed his ideas when talking, for the most part he had been dull and quiet, sleeping a great deal. During the year prior to admission to hospital restless periods had been more frequent and he had to be constantly watched that no harm would come to him.

On admission, a feeble old man who looked his age, presented peripheral arteriosclerosis, arcus senilis, a slightly accentuated second sound of the

heart and slight dullness over the apex of the left lung. Vision (presbyopia) and hearing were impaired. There was a general senile tremor and the gait was markedly trepidant. The tendon reflexes were elicited with difficulty.

Mentally the patient appeared confused. He was disoriented, cried when talking of his family and showed a marked memory defect for the grossest events, remote as well as recent. His attention was difficult to hold. The speech content was prolix and often incoherent. He was quite indifferent to his surroundings and when told he was in a hospital remarked it might do him good to remain here "for a little toning up."

Patient was in hospital a little more than three months, confined to bed all the while on account of general feebleness, showing throughout pronounced memory defect, finally dying from an intercurrent lobar pneumonia.

Anatomical Diagnosis.—Increased density of calvarium, adherent dura, pachymeningitis hæmorrhagica interna, leptomeningitis chronica, atrophy of cerebral gyri, cerebral arteriosclerosis; degeneration of myocardium (acute myocarditis), endocarditis; chronic perihepatitis, hepatic congestion, fatty infiltration; right lobar pneumonia and exudative pleurisy; colitis; interstitial pancreatitis and cystic degeneration of gland; chronic interstitial nephritis; scalp wound of right occipital region.

(Arteriosclerosis, but no gross focal lesions.)

Case XXVI.—W. S. H., No. 5486, a woman, widow, 78 years of age, admitted to the hospital when 62 where she had been ever since. She was always a peculiar character—self-willed, lacking in persistive power, odd—but save for an occasional attack of tonsilitis, last one eight years before admission, and a fall from a street car four years previous, slight injuries resulting, she had suffered no serious illness for more than 30 years. Although a good seamstress she was seldom employed at the same place twice on account of her oddities, so for many years up to 2 years preceding her admission had practiced as a professional medium. For several years it had been noticed by friends that she related imagined experiences as facts. Where she lodged the landlady had noticed that she frequently acted very queerly and on one occasion, about two years' prior to admission, she went to her sister's home late at night claiming to have heard the sister calling for her. During the three weeks before coming to hospital she had been far more talkative than usual, mostly about happenings of many years ago and about almost every one she ever knew.

A paternal uncle was insane. No other family history of importance elicited.

On admission she was well preserved for her age and was in good physical condition. Mentally she was somewhat excited, exhibiting periods of apparent confusion. In the clear periods she resented being brought to hospital, spoke in flowery language and was inclined to be dramatic. Memory for recent events poor. Later she gave evidence of auditory hallucinations, was irritable, made many complaints and developed ideas of personal importance, claiming that she was queen of England, etc. She

soon, however, adjusted herself to hospital regulations and was helpful in sewing room. Three years later she was less exhilarated and more inclined to depression. With the years she was contented at the hospital and quite indifferent. She remained in apparent good physical condition for about seven years when one day she announced to her hospital friends that she did not expect to live much longer, at the same time writing her will. She became irritable and markedly depressed. Examination revealed a grayish cauliflower-like growth involving vulvar and anus which was beginning to break down. The growth progressed rapidly and broke down (carcinoma). Death a month later.

Anatomical Diagnosis.—Increased density of calvarium, œdema of pia, atrophy of cerebral gyri, moderate hemiatrophy of cerebrum, advanced cerebral arteriosclerosis; thickening of mitral and aortic cusps, atheromatous degeneration of endothelium in ascending aorta; chronic adhesive pleuritis; fatty infiltration of liver and congestion; splenic congestion; cystic degeneration and anæmic infarcts of kidneys; introitus vagina, labia major et minora seat of carcinoma.

Case XXVII.—W. S. H., No. 7099, a man 70 years of age, never a healthy person, for 20 years prior to admission had been constantly under the care of physicians and had done no work. He had complained of dyspepsia and general weakness. He had always been contrary, irritable and impulsive and bore a reputation for oddness. When 66 years of age, his family began to notice that his memory was poor and that he was becoming childish. About two months before admission he had gone to the country and while there became quite restless and was frequently excited. While in the train returning to his city home he had what was described by friends as a "slight shock"—projectile vomiting and a marked, but suddenly developing mental confusion, during which he talked a great deal in an incoherent manner. Following this episode and up to the time of his admission, he showed considerable restlessness, was often confused, and lost himself easily in formerly familiar surroundings.

On admission there was distinct evidence of peripheral arteriosclerosis, arcus senilis, cardiac hypertrophy, increased and irregular heart's action and a chronic interstitial nephritis as revealed by urinalysis. The pupils reacted promptly to light and accommodation tests. Hearing was impaired, most marked in left ear.

Mentally the patient was confused and restless; comprehension poor. He laughed when asked questions.

The following day he gave, with fair accuracy, the data for his chart. He talked freely of places in Boston with which he was familiar, claiming to be in business there (romance). Remote events were described in detail, but of recent events he admitted a poor memory. "There has been some indefinite depression which I could not outgrow," he said.

Soon after and throughout there were alternating periods of confusion and periods with a fair degree of mental clearness. All the while memory defects for remote and recent events was progressive and he grew more

childish in his manner, giving utterance to many hypochondriacal complaints and was occasionally untidy, finally dying suddenly a little more than three years after admission.

Anatomical Diagnosis.—Cerebral congestion, chronic leptomeningitis, atrophy of cerebral gyri, granular ependymitis, cerebral arteriosclerosis, cardiac hypertrophy, endocarditis, thrombus of pulmonary artery; interstitial hepatitis; splenic congestion; gastritis; interstitial nephritis, cystitis, prostatic hypertrophy.

(No gross focal brain lesions.)

Case XXVIII.—W. S. H., No. 8931, a man 70 years of age, formerly a farmer, always of a retiring disposition, suspicious of the motives of others, egotistic and overbearing, nevertheless of poor judgment, began to have difficulty with his hearing 12 years ago, in consequence of which he became more and more isolated. For quite a long period (several years) he had heard noises in his head, but these were correctly interpreted as the result of his ear disease. Of late, however, these noises had been falsely construed. During the ten years prior to admission patient is said to have had several "mild shocks," but data concerning these are indefinite. Four years ago he met with an injury to his right hand, resulting in the loss of four fingers. The mental and physical shock from the injury was great and ever since there has been progressive mental and physical failure. Of late, he had been actively hallucinated (auditory) and was much disturbed in consequence, alarming the neighborhood with appeals to be saved from murder. He had shown a tendency to stray away, collect useless articles and in a confused manner would burn old newspapers indoors to drive away evil spirits. He had lost all sense of modesty.

On admission, a well-developed old man, 70 years of of age, somewhat obese, tidy in appearance, but rather decrepit. There is a deformity of the right hand as the result of a loss of four fingers. He walks in a halting trepidant manner and is slightly ataxic. There is a left facial paralysis with ptosis of the left eye lid. The pupils are contracted, equal, sluggish to light and do not react to accommodation tests. The tongue when protruded shows a coarse tremor and deviates to the left. Deafness is marked, apparently complete in the left ear and with the right ear the patient can hear only the shouted voice. Respirations are shallow, heart sounds faint, but rhythmic and of normal frequency. No cardiac murmurs. Right knee-jerk active, left absent, Babinsky and Openheim phenomena present on right side, plantar reflex on left side normal. Co-ordination tests poorly executed. A history of syphilitic infection fifteen years previous was elicited.

Mentally there appeared to be considerable dulling and marked emotional instability—crying without any adequate external cause. The speech was slow, thick and at times quite indistinct. The patient was entirely without insight into his condition; he thought he was being persecuted by his brother, and the reasons given for this belief were quite puerile if not silly. While he was at first quiet, there soon developed nocturnal restlessness

and a disposition to become noisy. Eight days after admission he suddenly became unable to rise from a chair in which he was sitting. There was no loss of consciousness, but his increasing feebleness made it necessary to confine him to his bed. Three weeks after admission a facial erysipelas developed which was followed, two days later, by a broncho-pneumonia from which he died ten days later, a month and six days after admission to hospital.

Anatomical Diagnosis.—Increased density of calvarium, external pachymeningitis, focal proliferative pachymeningitis, chronic leptomeningitis, atrophy of cerebral gyri; endocarditis; pleuritis, broncho-pneumonia; hepatic congestion; splenic congestion, perisplenitis, interstitial splenitis; interstitial nephritis; deformity of left hand.

(Focal luetic changes.)

CASE XXIX.—W. S. H., No. 8646, a spinster, 66 years of age, suffered an attack of insanity at the age of forty-seven which lasted for seven years. Recovery with defect. All her life she had been more or less eccentric and had masturbated persistently. Mother of patient and maternal grand parents died of cardiovascular disease, one relative was intemperate, another epileptic.

The salient clinical features on admission were peripheral arteriosclerosis, tachycardia, goitre, chronic proliferative arthritis of fingers and knees, high-arched palate, exaggerated deep reflexes, slight Romberg, general senile tremor, senile trepidant abasia and moderate spinal curvature (kyphosis).

Mentally there was mild depression, a tendency to assume affected attitudes, expression of indefinite fears and numerous hypochondriacal symptoms. Good orientation and retention of school knowledge and a fair memory. The patient easily adjusted herself to hospital surroundings. After two and a half months in hospital, periods of confusion, restlessness and loss of bladder and rectal control appeared. Three months later cerebral insult during the night. When seen next morning she was confused, heart's action weak and she groaned a great deal. She could not talk, but when aroused seemed to comprehend. Slight improvement, but speech content was limited to "yes" and "no," "well, I want to." Aphasic protocols made, showed that there was good comprehension of spoken language; she recognized and indicated the uses of objects shown, pointed them out when requested and could do the same for colors. She could write neither from copy nor dictation. She fatigued easily and frequently became confused during examination. Following the slight improvement after the insult there was gradual, but persistent failure. Death seventeen days later from an intercurrent lobar pneumonia.

Anatomical Diagnosis.—Congestion of dura, chronic leptomeningitis, frontal lobe atrophies, advanced cerebral arteriosclerosis, cerebral myelomalacia, multiple coarse brain lesions in left cerebrum and pons; chronic endocarditis, degeneration of myocardium; lobar pneumonia; hepatic congestion and chronic interstitial splenitis; multiple infarcts of kidneys; small sub-serous uterine fibromata.

CASE XXX.—W. S. H., No. 8759, a man 62 years of age suffered a cerebral insult at fifty-two, prior to which he had enjoyed good health. There was apparently good recovery. Six years later he had a second "shock" and since had never been well; physical and mental failure had been marked. His memory became impaired, he was often irritable, restless and had alternating periods of excitement when he was violent and threatening and periods of dullness during which he sat quietly staring vacantly into space. He had been hallucinated (visual) and contrary to former habits, became slovenly in person and untidy.

On admission, a fairly well-nourished man who looked older than his reported age presented peripheral arteriosclerosis, increased heart's action and a trepidant abasia. The pupils were unequal and reacted promptly to light and accommodation tests. The tongue deviated to the right. Right knee-jerk increased, right ankle clonus. Other tendon reflexes elicited. No Babinsky, no Oppenheim. General tremor of head. Choreic movements of the neck. Romberg sign.

Mentally the patient was disoriented, showed a memory defective for the grossest events, remote and recent. He cried when speaking of his family and his enunciation at times was very defective, but he seemed to comprehend when addressed; there were also short periods of confusion. He later showed some restlessness, frequently fabricated experiences, showed poor retention and was often untidy. On account of feebleness he was in bed all the while, apparently fairly content with his surroundings. Death after a hospital residence of three months and two weeks.

Anatomical Diagnosis.—Pachymeningitis hæmorrhagica interna, leptomeningitis chronica, atrophy of cerebral gyri, cerebral arteriosclerosis, multiple softenings and old apoplexies; cardiac hypertrophy, aortitis; pleuritis; broncho-pneumonia; hepatic congestion and hypertrophy; gastric ulcer; interstitial nephritis.

CASE XXXI.—W. S. H., No. 2829, a woman 60 years of age had a history of epileptic attacks since her 15th year. At twenty-eight, insane and had been ever since. In hospital since 1894 at which time she was very noisy, threatening and gave evidence of visual and auditory hallucinations. During her hospital residence frequent *grand mal* attacks, as many as 47 during a single month are recorded. Repeated attacks of excitement following a series of convulsions. A marked dementia during the five years preceding death. Following a severe epileptic seizure four years before death, development of an umbilical hernia. Death twelve years later from a strangulation of hernia noted above. During the last year she never attempted to walk on account of a marked unsteadiness and a gait which was staggering in character. Dementia had been marked.

Anatomical Diagnosis.—Cerebral congestion and arteriosclerosis; cardiac hypertrophy; pulmonary congestion and pleuritis; moderate interstitial hepatitis; splenic congestion; strangulated hernia; interstitial nephritis; cystic degeneration of right ovary, uterine fibroma.

Case XXXII.—W. S. H., No. 6851, a woman 85 years of age, when 80 was bitten by a mad dog, up to which time she had enjoyed good health. After the accident with the dog she was ill in bed for two weeks, but no evidence was elicited in the history suggestive of rabies, but since that time she had failed physically and mentally. On an average of about once a month during the two years prior to her admission to hospital she had been excited and delirious; her memory was poor, she was frequently untidy and had shown a tendency to roam around aimlessly. A year prior to admission she suddenly lost the use of both lower extremities and of her left hand (apoplexy), but this was not permanent for on admission she could walk. Six months later aphasic disturbances set in and for the six weeks prior to admission she had been unable to utter an intelligible sentence.

On admission, a rather small, very untidy and neglected old woman, who, when assisted, walked in a very trepidant manner, the gait shuffling in character and wide-spread. Heart's action weak and rapid, bronchitis, and evidence of chronic interstitial nephritis. General peripheral arteriosclerosis. Both pupils contracted and reacted sluggishly to light, the patient not co-operating for accommodation tests. Tests for hearing, unsatisfactory, although patient appeared to hear. Tendon reflexes elicited, the knee-jerks increased. Left-sided Babinski. Mentally the patient was dull and frequently appeared confused. She seemed to understand simple question addressed to her, but all attempts to reply resulted in an unintelligible paraphasia or in jargon, a condition which did not improve at any time during her hospital residence. On account of her inability to get about well she was kept in bed, although she frequently left bed to roam about the ward in a confused and aimless manner, she never seemed able to find her bed having once left it. Later she was unable, because of increasing feebleness even to get out of bed, and periods of confusion were more frequent. In the clearer periods she seemed to understand simple conversation addressed to her and appeared greatly pleased when the physician stopped to talk to her. A suppurating gland of the neck developed two months prior to death which never healed and two weeks later gangrene of the left foot. While she was in hospital she emaciated considerably, finally dying after hospital residence of three years and three months.

Anatomical Diagnosis.—Increased density of calvarium, congestion of dura, chronic hypertrophic leptomeningitis, atrophy of cerebral gyri and cerebellar foliæ, general congestion of brain, advanced arteriosclerosis of cerebral vessels; cardiac atrophy (?); anthracosis, atelectasis, pleuritis, moderate pulmonary congestion; moderate interstitial nephritis, senile atrophy of the reproductive organs; small wound of neck.

(Multiple old hæmorrhagic softenings of basal ganglia, both sides and in white substance.)

Case XXXIII.—W. S. H., No. 5203, a woman 85 years of age developed the symptoms of Paget's disease (osteitis deformans) 29 years ago. A

short while before the onset of the bone disease she had accidentally fallen through a trap door into the cellar. There was no history of fracture following the fall, but since that time she had never been quite well. Prior to the fall, save for inordinate modesty and a tendency to profuse sweating about the head, she was considered a normal person. Soon after the accident, she began to complain of pain in the back and knees. So severe was the pain that she could not take even a short walk without becoming prostrated. This, however, did not last long, for the pains became less severe, finally disappearing. After this her legs began to curve outward, her hips had the appearance of spreading and there was a curvature of the upper portion of the back (kyphosis cervico dorsalis). There was an interval of ten years before the sister who gave the information, again saw the patient. At this time the increase in the size of her head was striking and it was noted that she was much shorter in stature than formerly. In the meanwhile the thyroid gland had enlarged and there was considerable difficulty in breathing after the slightest exertion—going up stairs, taking a short walk, etc. She was very weak and it did not seem as though she would live long. Not long after this there was a severe illness during which there was free watery (?) discharge from mouth and throat. Her head, however, was no smaller after recovery from this illness, which from its general character was considered an attack of influenza. After recovery from the grippe she began to do and say queer things, continually growing worse during a period of nine months. In this time she was often confused, noisy, hallucinated and complained of paresthesias—worms crawling over the body, etc.

On admission, a rather feeble old woman presented an enlarged head with triangular-shaped face, base upward, enlargement of thyroid, particularly right lobe, cervico-dorsal kyphosis, a broad pelvis, lower extremities curved outward and forward. Heart's action was rapid and weak, pupils dilated and sluggish. Patient did not co-operate in other tests. The voice was peculiarly rasping in character, hoarse and rattling. She was noisy, her speech content was often incoherent, and she thought the food and drink given her were full of worms. In hospital eight years, in bed most of the time, untidy, noisy when anyone was near, thought she was being denied the comforts due her, was occasionally restless, getting in and out of bed. A year before death she had a fainting spell, during which the heart beat was scarcely audible, but recovered her usual condition in a few days. A year later, during an attack of bronchitis, she suddenly collapsed, dying ten minutes later.

Anatomical Diagnosis.—Osteitis deformans of calvarium (Paget's disease), cerebral atrophy, cerebral arteriosclerosis; chronic endocarditis of mitral and aortic valves; broncho-pneumonia; hypertrophy and calcareous degeneration of thyroid; chronic interstitial nephritis; osteitis deformans of spinal column and femur.

Analysis of Clinical Abstracts of Non-plaque Cases with Reference to Classification.

A survey of the cases without plaques from elderly persons dying insane shows that a large percentage (7 cases) falls readily into the clinical group of arteriosclerotic insanity. Two cases (XXVI and XXVII) may have been originally dementia præcox upon which arteriosclerotic changes were later superimposed, one without and the other with coarse focal lesions. Cases XXIII and XXV, even XXII, despite the multiple gross focal lesions, might be considered senile dementia and while not wholly " simple senile dementia " nor cases of presbyophrenia, fit in Wallenberg's second category.[83] Case XXXII offered difficulties in classification. Sensory and motor symptoms were accounted for in coarse brain lesions of arteriosclerotic origin. Mental failure, however, did not set in until the 80th year, even then psychical shock played no inconsiderable rôle. Case XXXI was an epileptic with history of seizures during a period of 54 years. In the hippocampal region histological lesions were plentiful. Striking features were great numbers of corpora amylacea (as many as 70 in a single oil immersion field), varying from the size of a red blood cell to a large lymphocyte of the blood stream, and colonies of large fiber-forming glia cells. Occasionally an amyloid body would present a fibril or fibrils wrapped around it in much the same way one would wind a string loosely around a spool, in quite the same manner as pictured and described by Alzheimer.[6] A single amyloid body, or a group of them, showed not infrequently an encapsulation with small glia cells and numerous fine glia fibers. The amyloid bodies were confined to the first and second cortical laminæ, mostly to the first. While no plaques in the sense of the structures described in a subsequent section were found, the similarity of the reactive gliosis and the position of corpora amylacea, always as it seems in dilated meshes of the glia recticulum, suggest an analogous origin for both processes.

One case, XVII, clinically and anatomically post apoplectic dementia, presented on microscopical examination in the gray and white substance at the periphery of a large recent softening of the left occipital lobe numerous large cells of a phagocytic character (*Abraumzellen* of the Germans). These cells were free in the tissue, and the adventitia and perivascular lymph

spaces of blood vessels in the vicinity were crowded with them. The cells without the vessels were often grouped in colonies and many gave the impression of having coalesced (Fig. 13). These groups of phagocytic cells do not appear at all comparable to the plaques dealt with in this paper. Bickel,[20] however, has described a like condition as a variety of plaque. In this case they were interpreted as the usual reaction following any acute destruction of nervous elements.

The age incidence of this group of cases is shown in the following table:

TABLE III.

Decade.	No. of Cases.
7th	7
8th	7
9th	3
Total cases	17

VII. MATERIAL FROM ELDERLY SUBJECTS WITHOUT PSYCHOSIS.

Six cases constitute this group, but one of them dying at the age of 54 cannot be considered, in a strict sense, as a case of senility. The case was added for the reason that in the autopsy protocol "cerebral sclerosis" had been noted. The remaining 5 cases were 80, 78, 75, 72 and 68 years of age respectively at the time of death.

CASE XXXIV, a man, 80, without psychosis, showed at autopsy pulmonary tuberculosis, chronic appendicitis, hydrocele and marked œdema of brain. Small pieces of brain fixed in formalin was available from the following areas: a six-layer type of cortex, probably frontal, anterior central cortex, corpus striatum and hippocampal.

In sections from all of the blocks of tissue plaques were found in goodly number, but most numerous in sections from the hippocampal region (Fig. 3). Alzheimer's intracellular degeneration of neurofibrils was seen in some cells of the large pyramidal layer, of Ammon's horn, missed in the other regions studied. The general histological changes of this case so far as demonstrable in Bielschowsky and Herxheimer's scarlet method for fat were essentially those as appeared in cases of senile dementia reported in this paper.

Cases XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, at autopsy, gave evidence of cerebral arteriosclerotic disease, atrophies, hæmorrhages, multiple focal softenings and the like.

In none of the portions of brains available from these cases were plaques found. The histological changes were more of the character of some of the cases with purely arteriosclerotic alterations.

Case XXXIV of this series, the case of Oppenheim, and cases reported by Simchowicz indicate clearly that plaques may be present without psychosis, and if the 31-year-old tabetic of Alzheimer be excepted, may be considered as evidence of senile involution. In the same manner that general histological changes of senile dementia are intensified over those of senile involution, so are plaques as a rule more numerous in senile dementia than in simple normal senile involution.

VIII. Results of Examination of Material of 50 Younger Subjects Dying of Various Mental Diseases.

In this supplementary group there were 27 cases of general paresis, 4 of manic-depressive insanity, including a case of involution melancholia, 3 of cerebral lues, 8 of microcephalic idiocy, 2 of tuberculous meningitis, 1 of purulent meningitis (streptococcus infection from middle ear) in a katatonic dementia præcox 35 years of age, 2 of brain tumor, 1 of psychosis associated with anæmia and diffuse degeneration of spinal cord (Putnam type), 5 of chronic alcoholism, 4 of dementia præcox and 1 of marked cerebral arteriosclerosis in a woman 50 years of age with a bad alcoholic history, dying of extensive hæmorrhage into the left lenticular nucleus. In addition to the above, a manic-depressive 60 year of age, 2 general paretics, one 68, the other 65, and a woman 76 years of age who had been continuously in hospital over 40 years, were examined.

None of the cases in this group exhibited plaques. In the arteriosclerotic woman dying from hæmorrhage and in one of the luetic cases (31 year of age) with multiple gumma, large fiber-forming glia cells and groups of macrophages laden with lipoid stuff were encountered at the periphery of gummata in the latter case, and about a small softening in the former case. These

cell colonies, however, were not the plaques with which we are concerned in this paper.

IX. The Plaques.

Methods Employed.—Bielschowsky's silver impregnation method, Mann's eosin-methylene blue mixture, fuchsin-light green, Mallory's phosphomolybdic hæmatoxylin—the three last as employed by Alzheimer—Weigert's glia and myeline sheath stain, Mallory's glia stain, scarlet after Herxheimer, van Gieson's stained after alcohol and bicromate fixation, Haidenhain's hæmatoxylin and toluidin blue after alcohol and on frozen sections, were the technical methods employed in the microscopical examination of the cases. The silver stain of Bielschowsky, Mann's stain, fuchsin-light green, Weigert's glia method—when successful—and scarlet on fresh material, proved the most instructive for study of the plaques. No case which failed to show plaques by Bielschowsky method revealed these structures by the other methods employed.

Microscopic Appearance of Plaques.—The general morphology of the plaques in silver impregnated sections and in sections stained with Mann's solution is characteristic. The other methods exhibit certain details with less uniformity. The plaques may be described as discreet structures of variable size in which a dark, circular, homogeneous, nuclear-like mass is centrally disposed. Surrounding the dark, homogeneous portion is an area of variable extent, always larger and lighter than the nuclear portion and darker than the adjacent brain tissue. (*Kern* and *Hof* respectively of Alzheimer.[5]) In the outer portion of the plaque (court), glia and nervous elements and other not definitely determined structures, fibrils, granules and globules, are found. Under low magnifications (Figs. 1, 2, 3), even with the oil immersion (Figs. 4, 5, 6), the plaques are usually circular. Other shapes—square (Figs. 7, 8), triangular (Fig. 9) and irregular forms (Fig. 17)—are encountered. Certain reactions of the glia in and about the plaques serve to differentiate what appear to be young forms from old ones. The glia constituents and the elements of nervous origin which one finds within the plaque exhibit not only progressive but regressive changes as well. The tinctorial nuances shown by the not clearly determined substances of

the outer portion indicate that these may be of different chemical composition—probably stages in elimination of the products of degenerated nervous structures. While the homogeneous nuclear portion is usually roughly circular in outline, higher magnifications revealed a jagged periphery which frequently imparts the appearance of the many-pointed star of an official seal. This is usually well shown with Mann's stain and often in silver preparations and fuchsin-light green sections. A well-defined nuclear mass, by these methods does not reveal any cellular contents. Nevertheless, plaques, such as Fig. 6, showed occasionally a group of nuclei at the center, in the position usually occupied by the homogeneous mass. Between these nuclei were clear spaces. Such microscopical pictures were interpreted as encapsulating glia cells about a nuclear mass not in the plane of the section. Plaques without a homogeneous nuclear-like mass are not rare and for the same reason, as pointed out by Alzheimer. An unquestionable attempt at glia encapsulation is often well brought out even in Bielschowsky silver preparations. Alzheimer[5] has published a convincing illustration of glia encapsulation of the nucleus shown in a section stained after the Weigert glia method. Fig. 6 is a photomicrograph of a plaque displayed in a silver impregnated section from Case X. Large fiber-forming glia cells are seen at the periphery sending fibrils which may be traced, on the one hand, as far as the nuclear mass and on the other hand—in at least one instance—to a nearby blood vessel. In the cases of this series, the glia cells in and about the plaques, although showing at times a rich fibrillosis, were more frequently of the type of gliogenous phagocytic cells. (*Gliogene Abraumzellen.* Alzheimer, Merzbacher et al.). Gliogenous phagocytic cells in frozen sections treated with Herxheimer's stain for lipoid substances, also with Mann's stain and fuchsin-light green after Flemming's fixation, are frequently met with. So-called amœboid glia cells are also displayed in frozen sections stained with Mallory's phosphomolybdic acid hæmatoxylin. In 2 cases of the series (XII, XV) Herxheimer's stain displayed a fine bright red stippling of the nuclear portion of the plaque which was not encountered in any of the other cases.

A somewhat distinctive type of plaque (Fig. 10) is best shown in silver impregnated sections. Here it will be seen, relatively

coarse, tortuous curled and club-shaped fibers dominate the picture. Other fine fibrils of about the caliber of neurofibrils, are encountered. These fine fibrils and by far the great majority of the coarse fibrils were not stained by any of the methods which display glia fibers. The fibrils, as can be seen from the photomicrograph, are disposed in a radiary manner. The whole plaque presents much the appearance of the ray fungus of actinomycosis to which it has been likened by several observers (Achúcarro et al.). The whole process, as shown in Fig. 10, presents many points in common with regeneration of nervous elements in the cerebrospinal axis such as is described by Bielschowsky, Pfeifer, Marinesco and others. Methods which display axis cylinders reveal these fibrils, although it must be admitted in a way which suggests that the supposed axis cylinders are undergoing a degenerative process. In Weigert myeline sheath preparations myelinated axis cylinders are occasionally seen within the plaque.

If we turn to Figs. 5 and 9, Mann's solution and fuchsin-light green stains respectively, many more or less discreet or confluent globular masses are shown in the body of the plaque between which clear spaces suggestive of channels are seen. Whether or not these spaces are channels for the passage of fluid stuffs from the nucleus to the periphery of the plaque, or in the opposite direction, or whether they represent a purely artificial fissuring resulting from the technique employed, is not clear. These fissures have been found alike in sections cut free after fixation in Weigert's glia mordant and in most carefully embedded material after the same fixative, subsequently stained with Mann's solution. The plaques in sections treated with Mann's solution, except where glial and vascular elements obtrude, are stained blue, the nuclear body a dark blue, the surrounding globules varying shades of a lighter blue. The globules shown in Fig. 9 for the most part are stained in varying nuances of red; sometimes one or more globules take on both the red and green elements of the stain and are then a muddy blue color. A semblance of the original glia reticulum is occasionally shown in fuchsin-light green specimens (Fig. 9) within which these globules seem to lie. With both stains, as shown in Fig. 6 and 9, discreet globules may be seen and larger masses which appear to have been brought about by a coalescence of smaller globules. Further,

there are globules which appear to be the result of thickening of trabeculæ in the diffuse glia mesh.

Some plaques (Figs. 7, 8, 10) show a thickening of fibrils about the periphery. Some of these fibers are evidently glia, as shown by various stains, and others appear to be axis cylinders. But the great majority of plaques (Fig. 4) were without evidence of thickening or proliferation of fibrils about their periphery.

Topographic and Stratigraphic Distribution of Plaques.— Plaques when present are usually widely distributed throughout the cerebrum. Areas of predelection, independent of general pathological alterations, are not the rule, at least not in this series. Case IX, however, exhibited plaques only in the left prefrontal and left hippocampal regions. The left prefrontal and left hippocampal in this case had nothing in the way of general gross alterations or even histopathological changes, save plaques, to distinguish them from the corresponding regions of the right side. But in general it may be said, the frontal lobes and the hippocampal regions display the greatest richness in plaques. Precisely these are the regions which show generally the most advanced and most extensive histological lesions in the brains of aged persons, whether dying insane or not. Cases IX, XIV, XV, exhibited in T_1 and transverse gyri of Heschl, a richness of plaques equal to that found in any prefrontal region of the entire series. Here, however, their number is commensurate with the general pathological lesions found in this area (see clinical analysis, p. 176). In general the occipital cortex shows the fewest plaques, but one case (V) presented in the occipital cortex almost if not quite as many plaques as were shown in its prefrontal regions. In this series, plaques have been found in the basal ganglia, white substance of the cerebrum and in the brain stem, also in medulla. In the cerebellum no typical plaques were found, but in Cases XIII and XV in areas of the molecular layer, dark and light staining, large as well as small corpora amylacea were seen in some foliæ, missed in others. Around these corpora there was occasionally a proliferation of glia fibers such as seen about numerous corpora amylacea in the hippocampal region of Case XXXI. No plaques have been found in the spinal cord, although cords were not available for all the

cases. Finally the portion of convolutions forming the lips of sulci show more plaques as a rule than the summit area.

As regards the stratigraphic distribution of plaques in the cerebral cortex considerable variability was shown. No cortical layer appears immune as a possible site for plaques. In a section where plaques are not numerous they are most generally confined to the layers of small and medium-sized pyramidals. In other instances, especially where clinical symptoms and general pathological changes were severe, an unbroken array of plaques extending from just beneath the pia, throughout all the cortical laminæ, deep into the white substance could be demonstrated (Fig. 2). In the hippocampal region, an area often equally rich as the frontal for its content of plaques, the greatest involvement is usually found in the layer of large pyramidal cells, but numerous plaques in all layers of this region are common. (Fig. 3.) Here, too, the largest plaques are most generally found. (Compare Figs. 2 and 3, which are photographs of the same magnification, one representing the prefrontal region, the other the hippocampal.)

In the white substance of convolutions, plaques, when present, are more numerous just beneath the cortex. Nevertheless, in the very center of the marrow stalk of many gyri a goodly number have been frequently found.

Relation of Plaques to Glia and Nervous Elements and to the Vascular Apparatus.—The presence of glial elements in and about plaques has been noted by practically all observers who have studied these miliary areas, but the interpretations of the glial elements have varied. From the studies of Held,[85] Alzheimer [86] and others, we have learned that the glia is more than a support structure for the mesoblastic and nobler epiblastic elements of the central nervous system and a replacement tissue in case of destruction of nervous elements; that an important group of glia cells does not proliferate fibers; that proliferated glia fibers are not necessarily emancipated, as was formerly supposed; that appreciable cellular glial proliferation may take place in advance of demonstrable alterations in the morphology of nervous elements; and that the glia possesses scavenger functions which, perhaps, are as important as any other function of this many-sided tissue. In and about the plaques almost every known characteristic of

the glia is demonstrable. While some of the glia phenomena may quite safely be looked upon as secondary reactions to the plaques as, for example, attempts at encapsulation by means of a rich fibrillosis—others are not so easily explained. Whether or not we can consider the plaques as originally groups of glia cells —secondary to some stimulus and yet primary in so far as plaque morphology is concerned—undergoing regressive changes into which nervous elements proliferate and later degenerate, is not clear. In any case, the problem as to the original stimulus which gave rise to the primary glial proliferation, whether originating from nervous elements or inherent in the glia itself, must be faced, even though a definite solution may not be reached.

Alzheimer[45] early maintained that certain glial proliferations surrounding corpora amylacea and other bodies were identical with the miliary sclerosis described by Redlich. Recently[46] he has argued a similar origin for plaques and amyloid bodies. But the views concerning the origin of amyloid bodies differ, falling readily into two classes: those which contend for an origin from regressive alteration in nervous elements and those which assign their origin to degenerated glia cells. As early as 1857 Rokitansky[47] maintained that these structures had their origin in regressive metamorphosis of myelin elements. Rindfleisch,[48] in a series of observations, published in 1863, stated that some of the small uninuclear cells between the fibers (presumably glia fibers) undergo an amyloid degeneration and concluded that the familiar corpora amalycea had their origin in this manner. Fromman,[49] in 1867, also advocated a glial origin.

Turning to more recent contributions which deal with the origin of amyloid bodies, we have on the one hand Ceci[50] (1881), Schaffer[51] (1890), Holschwenikoff[52] (1890), Siegert[53] (1892), Stroebe[54] (1894), Catola and Achúcarro[55] (1906), Nager[56] (1906) and Wolf[57] (1907), maintaining an origin from degenerating myelin sheaths, axis cylinders, end products of degeneration of nervous elements and the like. In short an origin from nervous elements. On the other hand, Redlich[58] (1892), Obersteiner[59] (1900), Nambu[60] (1907) and Hamilton[61] (1910), are convinced of the glial origin of corpora amylacea. It has been pointed out that amyloid bodies are generally found within the meshes of the glia reticulum. Quite generally, when not encapsulated by

actively proliferating fiber-forming glia cells, amyloid bodies in the central nervous system, are surrounded by a mass of glia fibers which, while variable in extent, do not seem to be due to a crowding of the trabeculæ of the diffuse glia net but apparently the result of a true fibrillosis. This is especially well shown even in Nambu's Fig. 1. The fibrillary glia wrapping about amyloid bodies, recorded in Case XXXI of this series (p. 193), and the amyloid bodies in the molecular layer of the cerebellar cortex of Cases XIII and XV with their surrounding glia elements show much in the way of glia reactions that are found in and about the plaques.

That actual proliferation of axis cylinders may take place in the portion of the plaque peripheral to the nuclear-like body is demonstrated in many sections from the cases of this series. The proliferated nervous elements do not appear to differ essentially from the proliferation of axis cylinders in glioma, focal compression of spinal cord (Bielschowsky[53]), injuries (Pfeifer[53]) and experimental lesions (Marinesco[54] and Marinesco and Minea[56]). These proliferations of axis cylinders the writer is inclined to consider as ineffectual attempts at replacement.

With regard to plaques and ganglion cells the examination of the cases here reported furnishes no good reason for supposing an origin from degenerated ganglion cells. True, ganglion cells at the periphery of plaques or even well within plaques are not rare findings. The great majority of plaques, however, do not show any especial affiliation with ganglion cells. It is also true that in not a few instances where ganglion cells are seen at the periphery or within the plaques such cells exhibit a fair state of preservation. Perhaps the best argument which may be used against a ganglion cell origin is the frequent appearance of a great number of plaques in the molecular layer and white substance of the cerebrum and this too without the slightest evidence of a heterotropia of the stratigraphy of ganglion cells.

Several observers have called attention to the not infrequent proximity of plaques to small blood vessels and the similarity, if not identity, of many granules found in plaques to granules found in the walls of the vascular apparatus under conditions of active destruction of nervous elements. In the 16 cases exhibiting plaques, while proximity to blood vessels was not rare—in-

stances of which may be seen in Figs. 7 and 8—the great majority of plaques were distributed without any such reference.

Association of Plaques with Alzheimer's Intracellular Degeneration of Neurofibrils.—In the study here reported, the type of intracellular degeneration of neurofibrils to which Alzheimer was the first to call attention, has been found in some of the severe cases of senile dementia, in some comparatively mild cases, in the case of precocious senile dementia (type of Alzheimer and Perusini) and in the case of an elderly man dying without psychosis. The number of cells exhibiting this type of neurofibril degeneration was variable, some of the cases showing only a few such cells, while in others, particularly in the frontal regions, by far the great majority of cells were so affected. In some sections it was difficult to find a ganglion cell which did not show the alteration. The small and medium-size pyramidal cells furnished the largest number of exemplars next to these the cells of the fusiform layer. In 3 cases (XII, XIII, XV), particularly in the frontal regions but also in regions of marked atrophy, all of the cortical laminæ were affected to the same extent. In another group of 3 cases such cells were found only in sections from the cornu Ammonis. Indication of this type of degeneration is also seen in sections treated by other methods which do not ordinarily display neurofibrils. In sections from corresponding areas treated after the Nissl method the evidence of marked cell degenerations is seen (Fig. 16). The distribution and intensity of ganglion cells affected with Alzheimer's degeneration corresponds on the whole with the distribution and intensity of general gross and histopathological lesions. Well-developed Alzheimer degeneration of neurofibrils was found only in brains showing plaques. One of the cases discussed under Section VIII, a manic-depressive 55 years of age, exhibited many cells of the character shown in the drawing (Fig. 12). Such cells were also found in cases in which many cells exhibited a well-marked Alzheimer degeneration and are interpreted as possibly an early stage in the process which leads to the peculiar whirl-like and snarled arrangement in the typical late stage. Nothing quite comparable was shown in the supplementary material, nor in the brains of the 17 elderly subjects dying insane but without plaques. A translation of Alzheimer's description of the order of changes in the intracellular

neurofibrils which lead up to the peculiar alterations has been given above (p. 153), to which the writer can add nothing essential. The photographs (Fig. 11) of the extreme manner in which some cells may be affected are more eloquent than a verbal description. Eight of the plaque cases exhibited this type of ganglion cell degeneration.

Attention would also be called to certain alterations found in ganglion cells, generally among the large pyramidals of Ammon's horn, rarely in other portions of the cerebrum (frontal region), which Simchowicz describes under the name of argentophile bodies. These bodies are small, homogeneous, usually circular bodies surrounded by clear spaces. The argentophile bodies are smaller than glia nuclei and are more numerous in cells from which neurofibrils seem to have disappeared (Fig. 15). The impression is that, perhaps, here we have to deal with coagulative residue of neurofibrils, in a certain sense a process comparable to that which leads to the formation of Alzheimer degeneration. Large argentophile bodies, such as described by Alzheimer in a case of circumscribed senile atrophy, were not found in this series, not even in the cases in which there were areas of marked focal atrophy.

X. Senile Dementia.

Campbell[56] in 1894, although not the first to call attention to certain characteristic changes in the ganglion cells in cases of senile dementia, wrote: "The most striking and constant change of senile insanity, however, is pigmentary or fuscous degeneration, which affects all nerve cells of any size; some large pyramidal cells and ganglial cells of the paracentral cortex may be seen wherein the change has advanced so far that the protoplasm is almost entirely replaced by pigment." Hodge,[57] about the same time, in a communication on senile changes of ganglion cells in man and the honey-bee, while not insisting "that nerve tissue is of any more importance in relation to physiological dying than any other tissue," contends that, the ganglion cell changes found in senium are to be interpreted as normal physiological changes, the counterpart of which may be seen in the parenchymatous cells of other organs undergoing involution. In so far as offering an explanation for the cerebral histology of senile dementia, Hodge's

viewpoint, while having won staunch adherents, has not received universal recognition. Robertson,[58] Carrier,[59] Alzheimer,[5] Frankhauser [60] and quite recently Simchowicz,[4] can see in the histological picture presented by brains of persons dying from uncomplicated senile dementia nothing but an intensification of the histophysiological alterations of normal senium. Siemerling,[61] Appledorn,[62] Fischer,[14] Léri [12 63] et al., and in a certain sense Southard,[64] too, conceive special pathological factors in addition to the normal alterations of senium, although the conception of these pathological factors are not definitely formulated.

In the earlier fatigue experiments of Hodge [65 66 67 68 69] and the more recent experiments conducted by Dolley [70] ganglion cell alterations, comparable to changes encountered in ganglion cells of persons dying of senile dementia, were produced in normal adult and young animals. In the one case, these alterations may be looked upon as the expression of cell exhaustion experimentally accomplished in short time; in the other, on account of their general character, no less a process of cell exhaustion produced by factors in operation over a long period. Whether the typical picture of the ganglion cells in senile dementia, or for that matter, the psychosis itself, is the result of chronic intoxication—a view to which Léri [63] inclines—or whether these cell changes are representative simply of a physiological apparatus worn out by long continued use, seem of secondary importance; for very likely beyond these lie other factors more fundamental and of greater moment.

Southard [64] and Léri [63] have urged particularly that one must always distinguish the clinical and anatomical changes of senium from changes which are only coincident with senium. This point the writer believes is well taken; for all too frequent mental conditions and anatomical findings which have little or nothing to do with senile dementia are classed among the distinguishing features of the psychosis.

The gross brain anatomy usually found associated with senile dementia is too familiar to be recounted, but a word should be said of the commonly associated atrophy and arteriosclerosis to which great etiological significance has been generally ascribed. As in the Danvers State Hospital cases recently reported by Southard [64] so, in the 33 elderly subjects dying insane recorded in this

paper, not one was without macroscopic evidence of arteriosclerosis. But the degree of associated atrophy was not always commensurate with the degree of arteriosclerosis, nor even when reversely stated was a definite relationship established. These findings, then, are also consonant with those of McGaffin [71] in his recent study of the Taunton State Hospital material.

To determine the existence or non-existence of atrophy from the accepted normal average brain weights is far from satisfactory for the reason of wide variations within the normal. The estimation of atrophy from the macroscopic appearance of the brain is also susceptible to error, for, as pointed out by Reichardt,[72] von Török,[73] Rosanoff and Wisemann,[74] and others, skull capacity must be taken into consideration in deciding for or against the existence of brain wasting. Until comparatively recently no attempts have been made to estimate skull capacity in relation to brain weights and such methods as have been sugested are tentative at best.

Attention has been called (p. 158) to the existence in this series of so-called normal-weight brains with manifest atrophy and gross focal lesions. One brain below the accepted standard for normal weight exhibited only a minimum of gross vascular change which could be attributed to arteriosclerosis (p. 159).

Southard [64] asks the very pertinent question: "Granting that physiological brain atrophy occurs, how can we distinguish pathological atrophy therefrom?" He then proceeds to answer: "First, the loss in weight is more marked in the latter. Secondly, the onset of the process may be premature. Thirdly, the progress of the atrophy, as distinguished by clinical observation, may be much more rapid. Fourthly, a group of cases will show differential loss in brain weight, whereas the other organs will maintain weight better." Southard does not contend against "general nutritive conditions, in part arteriosclerotic in origin," as etiological factors in senile dementia, but argues that local vascular changes as producers of atrophy have not been proven. He thinks that, "senile atrophic changes in general" are "similar to those unknown conditions which underlie thymus atrophy or menopause changes." One gathers from Bolton's [75 76] researches that he conceives for many forms of insanity an arrested development of certain cortical layers which may explain in part the

generally low brain weights in persons dying insane. In Bolton's senile dementia cases, however, there were reported instances in which brains weighed well within the accepted normal range. In the series of cases here reported, much smaller to be sure than Bolton's (the latter's included 1000 cases of various forms of insanity), "the relationship of the degree of wasting to the degree of dementia" was not always, or even commonly, "very exact." Finally, concerning atrophy, attention would be called to the studies of Donaldson [17] who, nevertheless, emphasizes the danger of applying conclusions drawn from laboratory experiments on lower animals, where conditions may be controlled, to man, where conditions are almost never controllable. To quote Donaldson: "The brain, like other organs, has much water in it. I have followed in the rat the change in the percentage of this water from birth to maturity. It diminishes by approximately ten points and this diminution is very closely correlated with age. At birth the water forms about 88 per cent of the brain, and at maturity, about 78 per cent. . . . . For the percentage of water in the human brain the data are meager, but so far as we can gather them, they correspond to those for the rat, and when adjusted for the rapidity of growth, the curve for man fits that for the rat. A very striking coincidence."

Concerning the vascular changes, Friedmann [18] differentiates the physiological vascular alterations of senium from the pathological vascular alterations by atrophy of the muscular coats in the former and proliferation of the connective tissue fibers in the latter.

It would follow, at least in part, from the cited observations and the observations recorded in this paper, that atrophy and arteriosclerosis in senile dementia rather than dependent the one upon the other are often merely coincident, but it is conceivable that the latter under certain conditions—disturbance of the nutritive supply, etc.—may hasten or increase the former.

The microscopical findings in the brains of the 33 elderly subjects of this series are on the whole sufficiently distinctive to separate the cases into two chief groups, and this not alone by the presence or absence of plaques, but by the sum of their histological alterations which show certain differences of a qualitative character.

The histological changes of the 16 plaque cases will be briefly considered in the order of pial, vascular, glial and ganglion cell alterations:

The pia in all of the plaque cases save one, Case II, exhibited proliferative alterations, more marked in some of the cases than in others, most pronounced over the frontal convexity, the upper half of the central convexity, over the larger sulci—particularly the Sylvian—and over the superior surface of the cerebellum. The pial hyperplasia consists in a proliferation of its most external cells (endothelial layer), a great increase in number and thickness of connective tissue fibers and the fibroblasts which give rise to such fibers. The fibroblasts frequently exhibit regressive alterations. These proliferated elements of the pia produce a thickening of the membrane of from 4 to 8, or even more times, the normal thickness of this structure. Between the proliferated fibers large heavily-laden pigmented cells of the same general character as the macrophages (*Koernchen Zellen*) of the cortex are found, their number usually proportionate to the number of such cells found in the walls of the cortical vascular apparatus. The content of these cells is shown, by suitable dyes, to be chiefly so-called lipoid substances. Extracellular lipoid granules are also encountered free in the pial mesh. Here and there in sections of the pia, lymphoid cells are occasionally seen but never in great number and in some of the cases a few mast cells are observed. None of the cases exhibited plasma cells. The "osteoid plates" described by Robertson are not rare findings, but these precursors of the commonly occurring spinal osteomata are, however, far less numerous in the cerebral distribution of the membrane than in the spinal pia. The blood vessels of the pia present much the same condition as will be described for the vessels of the brain.

The vascular alterations are regressive as well as progressive, on the whole, the former predominating. In alcohol-fixed material stained with toluidin blue or with Nissl's methylene blue-soap solution, the endothelial cells of large and small vessels exhibit frequently a darkly staining and rather elongated nucleus. More frequently than not the protoplasm of endothelial cells is tinged, exhibiting also lipoid granules. With Herxheimer's fat stain the lipoid content of endothelial cells is well displayed.

Swelling and splitting of the elastica are frequently very pronounced in the larger vessels. The cells of the muscularis generally show a rich fatty content and markedly degenerated elements are common among them. The adventitial cells are commonly proliferated, but the most striking feature of these cells is their rich lipoid content. Here, too, one finds frequently free lipoid granules and richly pigmented macrophages such as described for pia. The connective tissue fibers in some of the cases, usually in the older subjects, were markedly proliferated, in small as well as in large vessels. So marked was the fibrous proliferation of the vessel wall in such instances that the process could worthily be designated as an "arteriofibrosis" (Fig. 14). The arteriofibrosis was best displayed in Bielschowsky silver impregnated sections and in sections treated with Mann's eosin-methylene blue solution. These proliferated fibers are arranged either in a thick annular manner or in a series of spirals which give a latticed appearance. Three of the non-plaque cases also presented a rather marked arteriofibrosis, but these were among the oldest subjects of the group which aside from a plaque had much in common, histologically, with the plaque cases as a whole. Hyaline degeneration of the wall of small vessels is occasionally encountered but less frequently than in the seven more typically arteriosclerotic cases of the non-plaque group. Depending upon the degree of cortical disturbance and upon the acute, subacute or chronic character of these disturbances great numbers of heavily pigmented macrophages are seen in the adventitia and perivascular lymph spaces.

The glia changes are also progressive and regressive in character, the former, perhaps, predominating. These changes affect the cellular as well as the fibrillary glia. Colonies of small fiber-forming glia cells and colonies of giant glia cells are encountered in the cortex. The glia "keel" of the molecular layer is of greater extent than normal and in many instances equal in extent to the glia proliferation found in this region in cases of general paresis. The caliber of the proliferated glia fibers, however, is more delicate than the proliferated fibers of general paresis. Many of the glia cells, not only those in the vicinity of degenerating ganglion cells, show a rich pigment content of their protoplasm, fuscous stuff of apparently the same character as that

seen in ganglion cells. In cells of the spider type yellow pigment (toluidin, blue, stained red with Herxheimer's scarlet stain) deposited in fine granules is often seen. Where a process is given off from such a cell to a nearby blood vessel the impression is imparted that in this manner a part at least of the products of pathological metabolism find their way to the blood stream for elimination. A noticeable feature of these 16 cases was the comparatively insignificant satellitosis. Where ganglion cells are the most degenerated, as for example those cells showing an advanced stage of Alzheimer intracellular degeneration of neurofibrils, satellites are either entirely absent or at most exhibit in their vicinity only a few such cells, and this regardless of the cortical laminæ in which such cells are found. Aside from the types of glia cells already mentioned amœboid glia cells (Alzheimer) gliogenous phagocytic cells and a few rod cells (*Stäbchen Zellen*) of glial origin are encountered.

The most striking characteristics of the ganglion cells are atrophy, tortuous dendrites which in Nissl preparations may be followed for a considerable distance from the cell, and marked yellow pigmentation. The pigmentation is not confined to the base of the cell but generally deposited throughout the cell and may be followed in the apical dendrite as far as this process is visible. The intense lipoid pigmentation is best seen in frozen section stained with scarlet after Herxheimer. Some of the cells are mere shadows, some are encrusted, others present large vacuoles. In addition to these chronic nerve-cell changes acute changes are often superimposed. The neurofibril changes, on the whole, are such as previously described by Bielschowsky and Brodmann,[79] the writer [80] and others, 8 of the cases exhibiting Alzheimer degeneration. While there is usually no marked disturbance in cell lamination, as in general paresis, there are instances of considerable diminution in the number of cells present. Where Alzheimer degeneration is advanced indications of cell devastation, although not *en bloc,* are seen in corresponding Nissl preparations from the same regional areas. Finally the presence of plaques in greater or less number serves as an additional microscopical feature to differentiate these cases.

In the non-plaque material from elderly subjects dying insane, as pointed out above, 7 are clearly arteriosclerotic dementia on

their clinical side. These 7 cases present wedge-shaped cortical areas of destruction in which there is marked fibrillary glia proliferation. In 3 of the cases if one puts aside the focal lesions the remaining anatomical changes are not essentially different from the preceding group, save in the absence of plaques. On the other hand, one of the plaque cases presents the general histological lesions, including wedge-shaped areas of cortical destruction as found in 7 cases of this group. The plaque cases, as a whole, present lesions more closely allied to senile dementia and normal senile involution, the non-plaque cases, by and far, lesions which are better classed as arteriosclerotic.

The general histological changes found in Case XXXIV, an elderly subject without psychosis, are essentially the same as those of the plaque cases, though of less intensity. The histological changes in the remaining 5 subjects were more of the character of lesions found in the purely arteriosclerotic cases.

XI. Summary and Conclusions.

The central point of this study has been the miliary plaques commonly found in the brains of persons dying at an advanced age. Consideration, however, has been given many other factors which might have a causative relationship, or at least serve as an explanation for these peculiar structures. A reasonable number of cases, 89, have been studied more or less systematically and 4 other cases added to the supplementary group discussed under Section VIII brings the total to 93. Some of the findings lead to conclusions which may be stated with a degree of positiveness almost axiomatic; others still await interpretation. The results of this study may be summarized as follows:

(1) While 87.5 per cent of plaque cases exhibited atrophy sufficiently marked to be detected with the unaided eye, other cases with equally marked atrophy were without plaques. Cases with brains weighing well within the range of accepted normal weight have shown plaques on microscopical examination, while other cases coming under the same category have been negative.

(2) A large percentage, 62, of plaque brains exhibited gross focal lesions resulting from arteriosclerosis and all showed more or less advanced cerebral arteriosclerosis. But cerebral arteriosclerosis was even more pronounced in non-plaque brains. Ar-

teriosclerosis *per se*, therefore, appears to have little, if any, direct causative relationship to the formation of plaques.

(3) Brains exhibiting general histological evidence of senile involution, whether from persons dying insane, or from persons dying without psychosis, are the most likely to yield plaques.

(4) Since plaques have been found in the brains of elderly persons dying insane and in the brains of elderly persons dying without psychosis, and also as recorded in the cases of a young tabetic without psychosis, these peculiar structures cannot be considered as characteristic for any special form of mental disease, although occurring with greater frequency in senile dementia than in any other form of insanity.

(5) The onset of senile involution varies in different persons and this may explain the presence of plaques in the brains of some elderly persons and their absence in others.

(6) From the evidence furnished by Case XV of this series and the published cases of Alzheimer and Perusini, a precocious senium is conceivable. By precocious senium something more than an early cerebral arteriosclerosis is meant.

(7) Plaques when present in a given subject are more numerous in the portions of the brain which show the maximum of general pathological alterations. Hence in senile dementia the group of cases which shows the most frequent and extensive involvement, the frontal and hippocampal regions, as a rule, exhibit the greatest number of plaques.

(8) The presence of plaques in the molecular layer of the cortex and in the white substance, often in great numbers, leads the writer to contend against an origin from degenerating ganglion cells. The view of deposited products of pathological metabolism resulting from degenerating nervous elements (fibrils) is advocated. The glial and also the apparently incontrovertible neural proliferations are interpreted as attempts at elimination of the deposited products. These attempts at elimination and replacement, nevertheless, do not appear successful.

(9) The general histological evidence of these cases tends to show a similarity between the lesions of senile dementia and normal senile involution of the brain. The non-plaque cases of the series more nearly approximated the histological lesions of arteriosclerotic dementia. On the other hand certain non-plaque

cases which coursed clinically as senile dementia did not show histologically, except by absence of plaques, lesions essentially different from the plaque cases.

(10) Uncomplicated senile dementia, on histological grounds, appears, therefore, to be only an intensification of alterations found in normal senium.

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EXPLANATION OF PLATES.

FIG. 1.—Bielschowsky's silver impregnation. Plaques in outer laminæ of paracentral cortex of Case I, severe form of senile dementia (presbyophrenia). Bausch & Lomb ⅔ achromat. obj., no ocular, bellows extension 1 m. 75 cm.

FIG. 2.—Bielschowsky's silver impregnation method. An unbroken array of plaques extending throughout the cortex into the marrow. Prefrontal area, left, of Case XV. Clinically and anatomically resembling cases described by Alzheimer and Perusini, designated in 8th edition of Kraepelin's Clinical Psychiatry as "Alzheimer's Disease." Verick obj. No. O, no ocular, bellows extension 1 m. 92.5 cm.

FIG. 3.—Bielschowsky's silver impregnation method. Ammon's horn of Case XXXIV, a man aged 80, dying without psychosis. Plaques in this region are generally larger than found elsewhere. Compare with Fig. 2, both figures taken under identical magnification.

FIG. 4.—Bielschowsky's silver impregnation method. High magnification of one of the plaques shown in Fig. 1. A homogeneous nuclear-like body is displayed surrounded by globules, between which there is a diffuse tingeing, rod-like fragments—some straight, others slightly spiral. At periphery, lower right, an intact ganglion cell. No appreciable thickening nor proliferation of axis cylinders. Zeiss 2 mm. apochromat obj., projection oc. No. 2, bellows extension 80 cm.

FIG. 5.—Mann's eosin-methylene blue stain. Frontal area of Case XIII, "simple senile dementia." The plaque exhibits a central dark homogeneous mass with peripheral projections. Surrounding the nuclear-like mass irregularly staining globules and glia cells are seen. (Alzheimer's *Kern* and *Hof* respectively.) In the portion of the plaque designated as the "court" fissures suggestive of channels are seen. Whether these fissures are artefacts, or whether channels for the elimination of degenerated stuffs is not determined from this study. Zeiss 2 mm. apochromat obj., projection oc. No. 2.

FIG. 6.—Bielschowsky's silver impregnation method. Frontal area of Case X, severe senile dementia complicated with advanced cerebral arteriosclerosis. Moderately advanced attempt at glial encapsulation. Large fiber-forming glia cells at periphery sending, on the one hand, fibrils which may be traced as far as the central nuclear mass and on the other hand, in one instance at least, fibrils to a nearby blood vessel.

FIG. 7.—Bielschowsky's silver impregnation method. Large, more or less square plaque from the innermost layer of left prefrontal regio.., Case V, a woman 79 years of age, who had recovered with defect from a psychosis 27 years previous, suffered various severe illnesses during the first 40 years of life and in the last illness presented clinically severe involution symptoms which were also demonstrated anatomically. A dark homogeneous central mass is shown surrounded by numerous fibrils many of which, under sharp focus, are observed to stand in direct relation with glia cells. Below and to right a blood vessel showing progressive-regressive changes. Zeiss 2 mm. apochromat obj., projection oc. No. 2, bellows extension 90 cm.

FIG. 8.—Bielschowsky's silver impregnation method. More or less square plaque from right cornu Ammonis, Case V, described in preceeding legend. In the region where the homogeneous dark staining mass is usually found, there is shown in this photograph a colony of glia cells which is interpreted as an encapsulating gliosis of a nuclear mass not within the plane of the section. Globular masses, fibrils and peripheral fibrillary gliosis are also present, the latter, however, not in good focus. The photograph was taken to show mainly the central group of glia cells. Photographic details as in Fig. 7.

FIG. 9.—Fuchsin-light green stain. Frontal area, right, Case I. The plaque is roughly triangular in shape, presenting a nuclear-like mass near its mid-portion, numerous globules which take the red element of the stain in various nuances, numerous fuchsinophile granules, fragments of axis cylinders and glia nuclei. Unfortunately the photograph does not do justice to the various color reactions of the plaque which are beautifully displayed by this stain. Zeiss 2 mm. apochromat obj., no ocular, bellows extension 1 m. 22 cm.

FIG. 10.—Bielschowsky's silver impregnation method. Parietal area of Case V described in legend for Fig. 7. The plaque is composed chiefly of rather thick, curled and spiral fibrils which are not glial, but, for the most part, proliferated axis cylinders. Many of these fibrils are undergoing regressive changes. This type of plaque, while not rare, was less frequently encountered in this study than the type of plaque shown in Fig. 4. Zeiss 2 mm. apochromat obj., projection oc. No. 2, bellows extension 95 cm.

FIG. 11.—Bielschowsky's silver impregnation method. Ganglion cells exhibiting Alzheimer's type of intracellular neurofibril degeneration. Despite the marked alteration of the cells there is no satellitosis. Indeed in the neighborhood of some cells satellites are absent. Nine cases presented this type of ganglion cell degeneration. In 3 cases they were found only in the cornu Ammonis and one of these was an aged man dying without psychosis. In general the frontal and hippocampal regions show the greatest number. Sometimes, in frontal lobes all of the cortical laminæ are affected. Where such cells are few the small pyramidals present the greatest involvement, next to these the cells of the fusiform layer. Some

sectio... show scarcely a cell in which there is no evidence of the change. All of the cells here photographed were taken under the same magnification and represent different cortical laminæ. Zeiss 2 mm. apochromat obj., projection ocular No. 2, bellows extension 1 m. 50 cm.

FIG. 12.—Bielschowsky's silver impregnation method. Large pyramidal cell of prefrontal cortex from a manic-depressive, 55 years of age. No plaques found. The case was one of the supplementary material discussed under Section VIII. Many ganglion cells showed darkly staining, thick, tortuous neurofibrils suggestive of possible early stage in Alzheimer's degeneration. No young subjects showed anything quite comparable. Similar cells were also seen in cases which showed a well-advanced Alzheimer's degeneration. Drawn with the aid of an Abbe camera lucida, Zeiss 2 mm. apochromat obj., compensating oc. No. 8. Reduced ⅙.

FIG. 13.—Fuchsin-light green stain. Blood vessel in the marrow of right occipital lobe near the cortex and at periphery of recent focal softening, Case XVII. Clinically a case of post apoplectic dementia; anatomically recent focal softenings, pachymeningitis hæm. interna, marked hemiatrophy due to ancient lesions of left basal ganglia and internal capsule. Numerous large *Abraumzellen* free in marrow and cortex, singly and in colonies some of which have coalesced. Adventitia and perivascular lymph spaces crowded with such cells. Coalescence of such cells have been described by Bickel as a form of plaque, here interpreted as usual reaction to acute destruction of nervous elements which may be found in any brain under like conditions. Zeiss 8 mm. apochromat obj., projection oc. No. 4, bellows extension 1 m. 72.5 cm.

FIG. 14.—Bielschowsky's silver impregnation method. Small vessel in layer of small pyramidal cells paracentral cortex of Case V. Arteriofibrosis described in the text. This type of vascular change was found in most of the older plaque cases and also fairly common in the purely arteriosclerotic cases of the non-plaque group of elderly subjects. Zeiss 2 mm. apochromat obj., projection oc. No. 2, bellows extension 96 cm.

FIG. 15.—Bielschowsky's silver impregnation method. Cornu Ammonis of Case XVI. Large pyramidal cell exhibiting coarse dark granules surrounded by clear spaces (argentophile bodies). Such cells are common in Ammon's horn, but have been found also in the frontal areas. Usually where found intracellular neurofibrils have for the most part disappeared. Zeiss 2 mm. apochromat obj., projection oc. No. 2, bellows extension 1 m. 27 cm.

FIG. 16.—Toluidin blue stain after Nissl. Prefrontal area, left, Case XV. To show the ganglion cell devastation in an area where plaques and Alzheimer's degeneration were well marked. Bausch & Lomb ⅔ achromatic obj., no ocular, bellows extension 1 m. 92.5 cm.

FIG. 17.—Mann's eosin-methylene blue stain. Paracentral cortex of Case XIII. Irregularly shaped plaque showing superiorly large glia cells and a few small globular masses apparently within the glia mesh. Zeiss 2 mm. apochromat obj., no ocular, bellows extension 1 m. 37.5 cm.

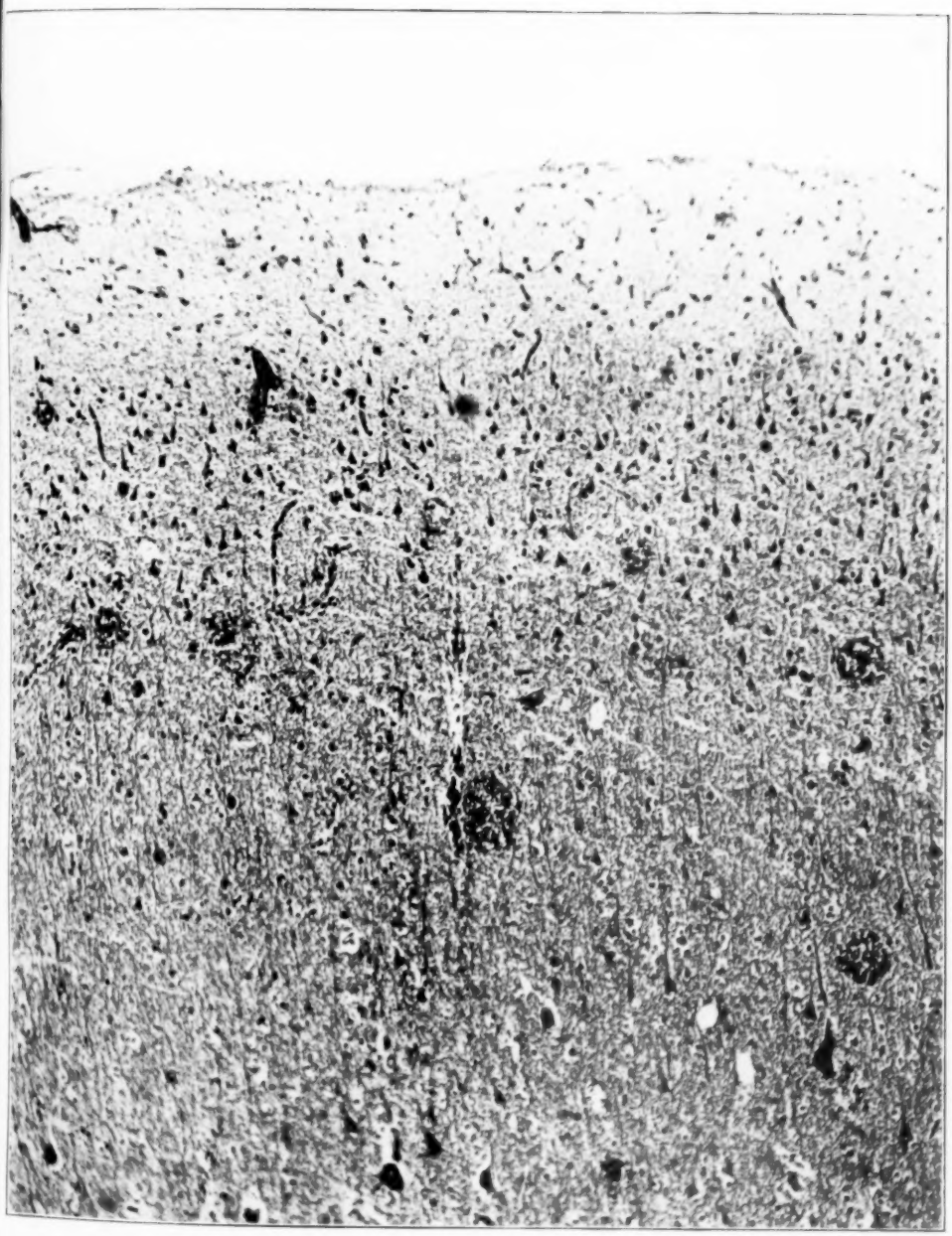


FIG. 1.

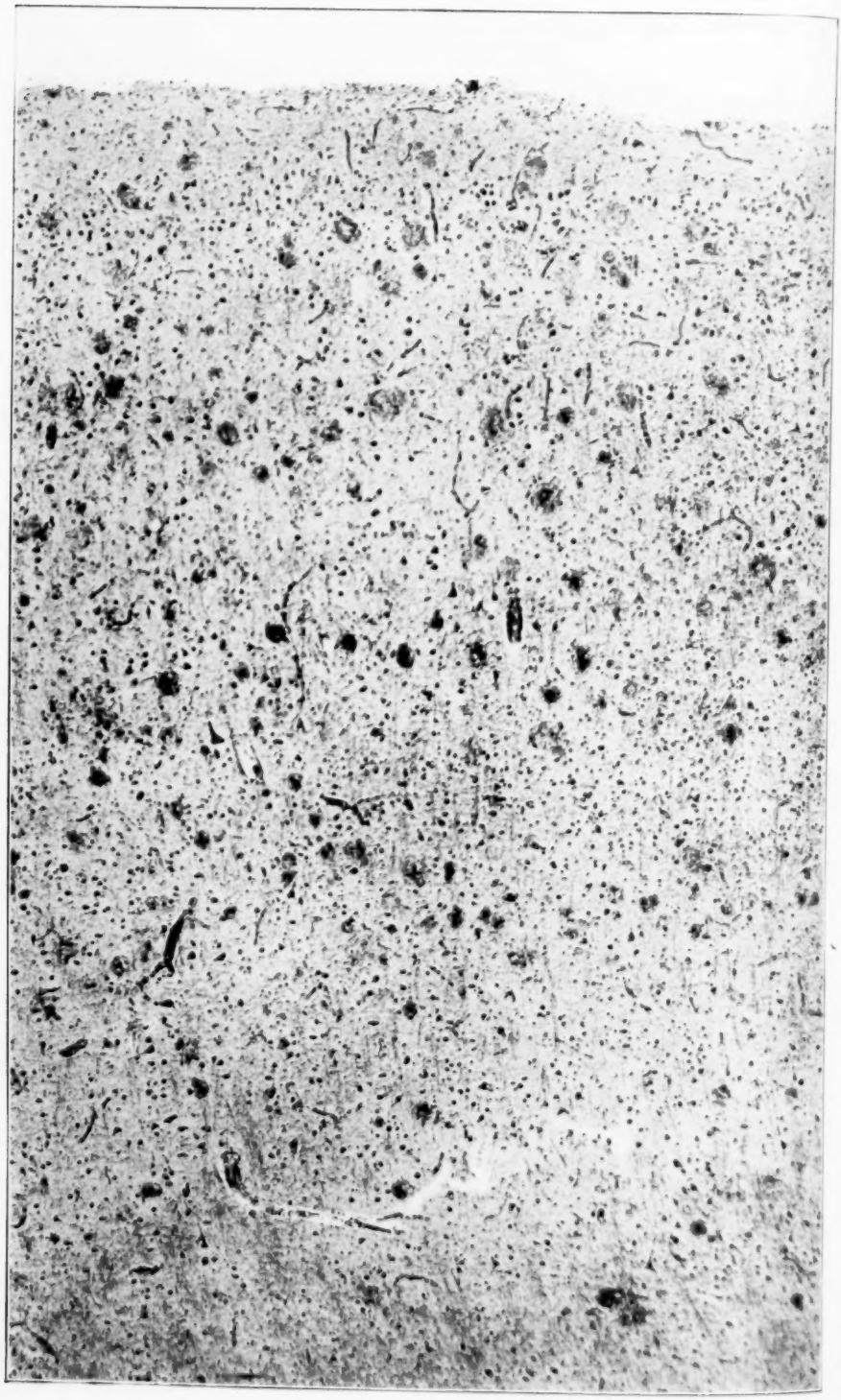


FIG. 2.

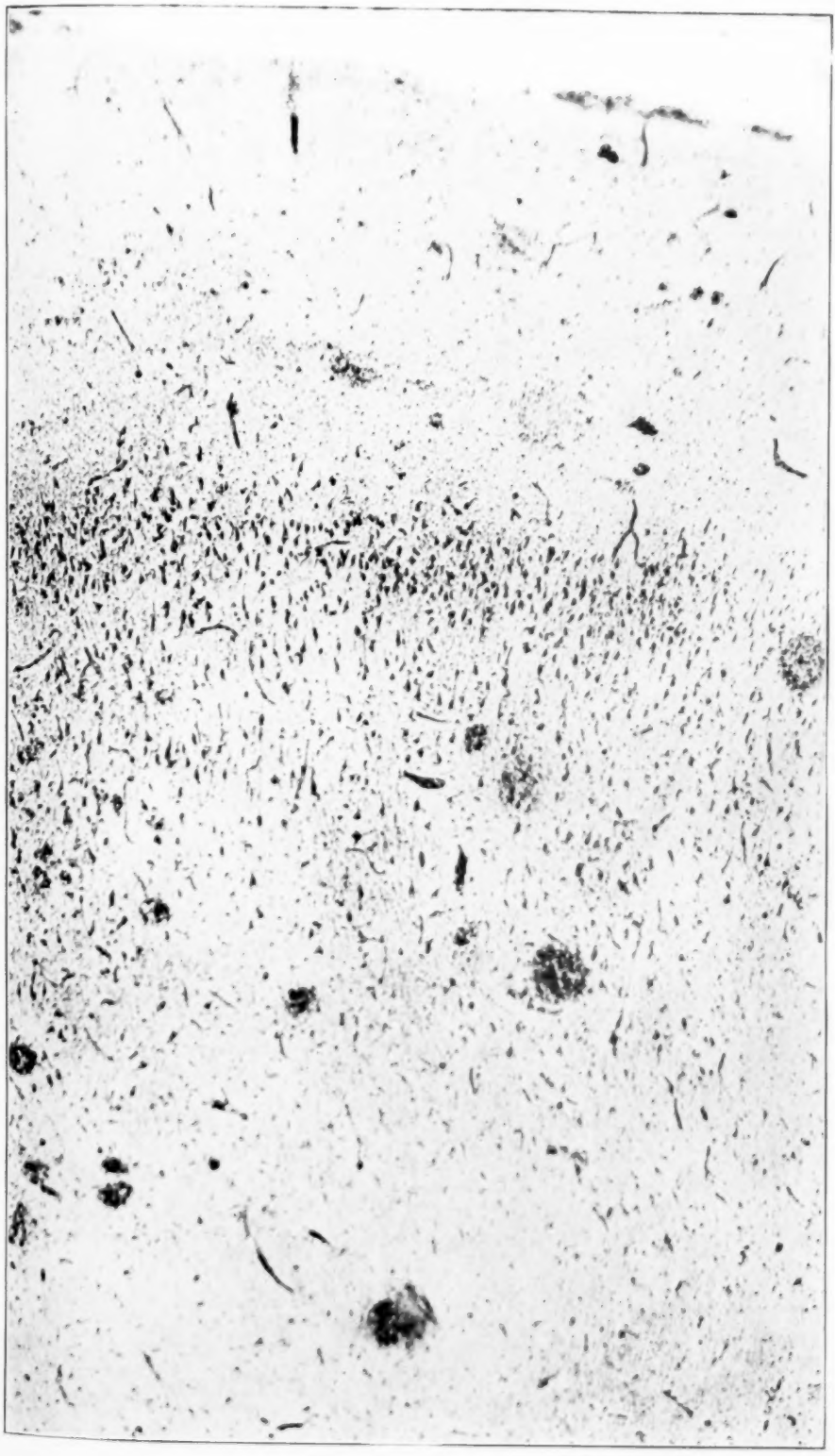
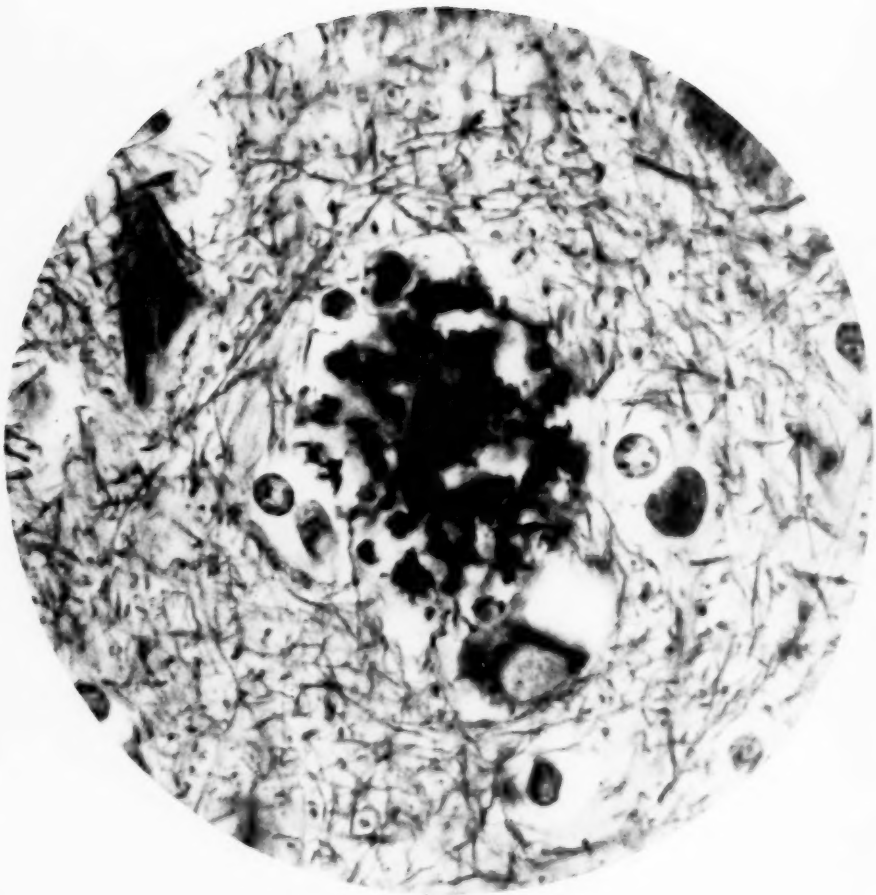


FIG. 3.



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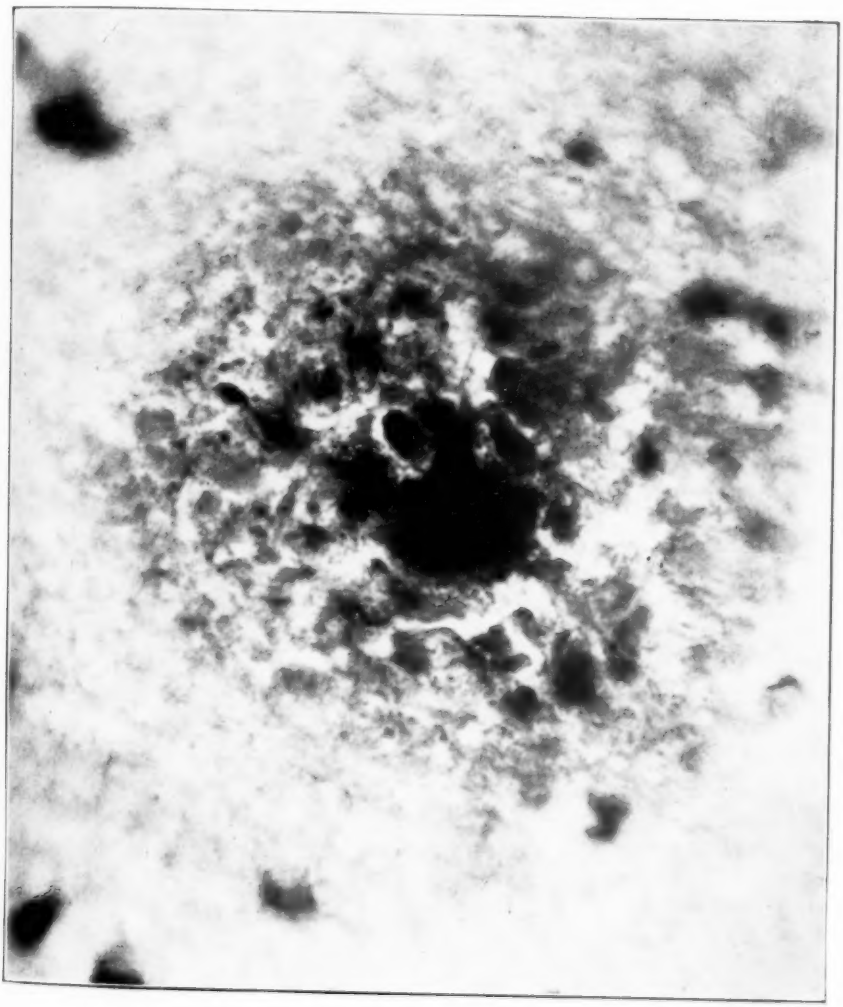


FIG. 5.

FIG. 6.

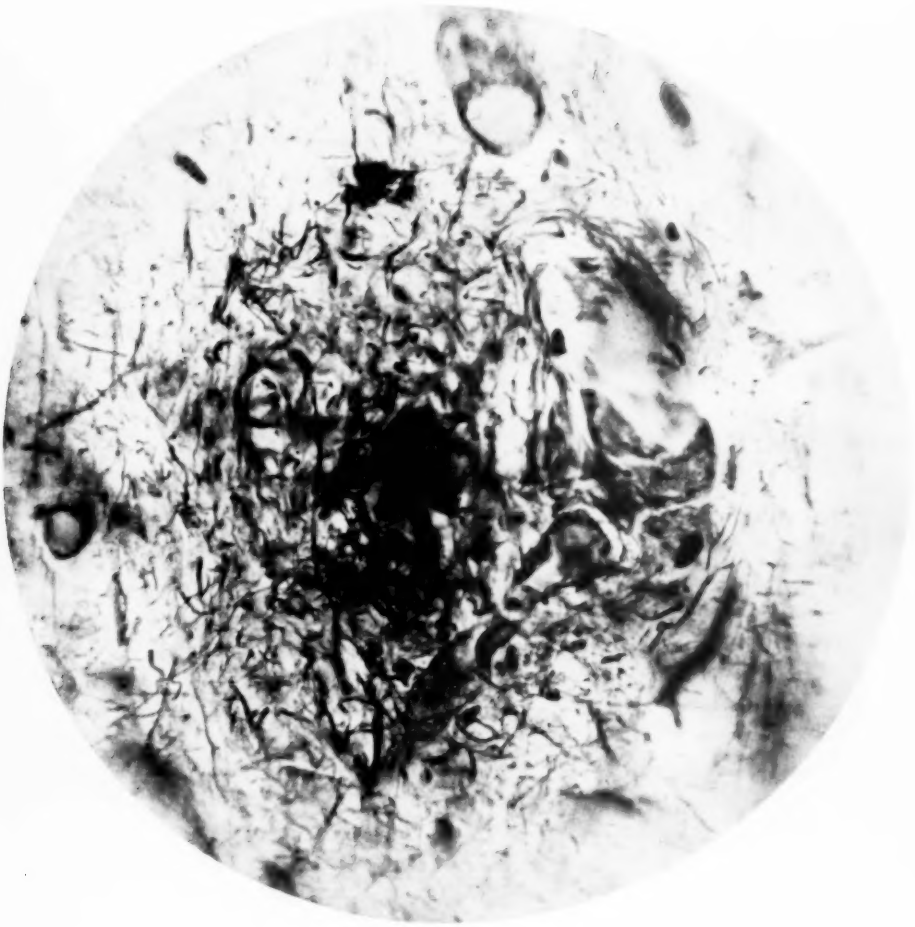


FIG. 7.

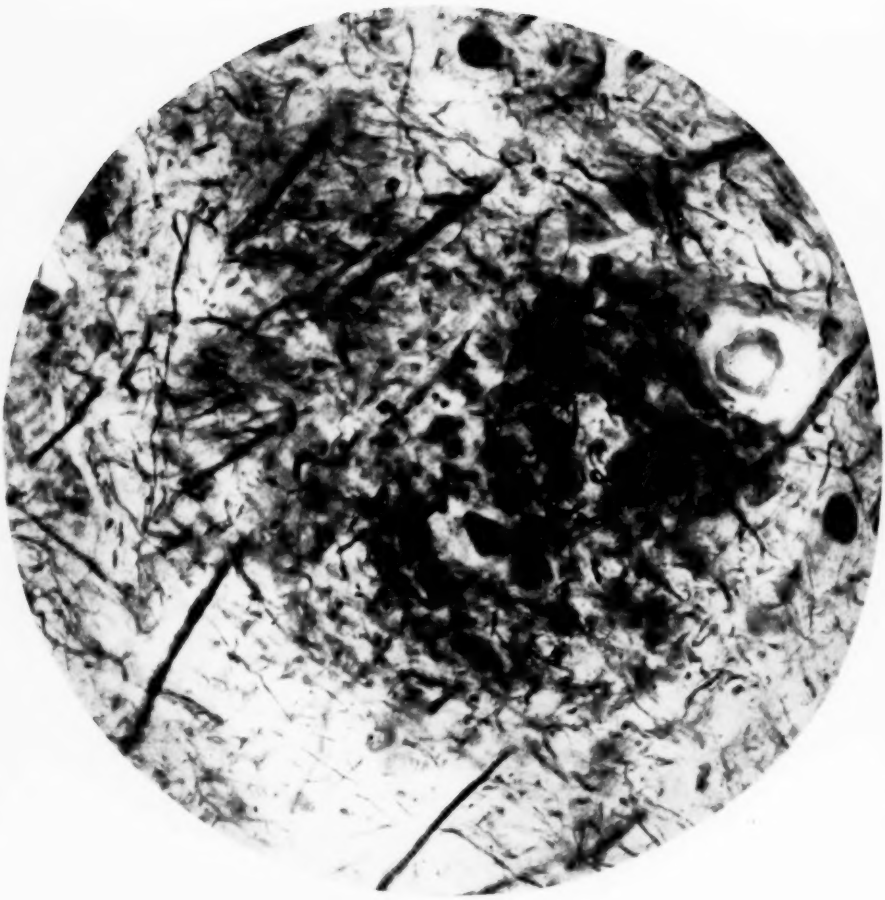


FIG. 8.

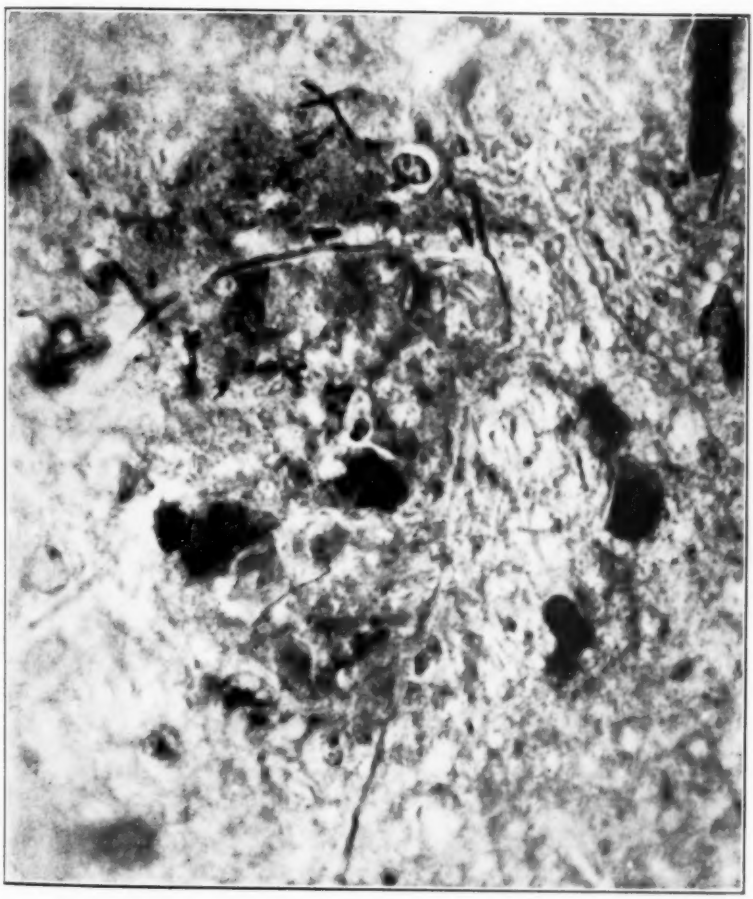


FIG. 9.

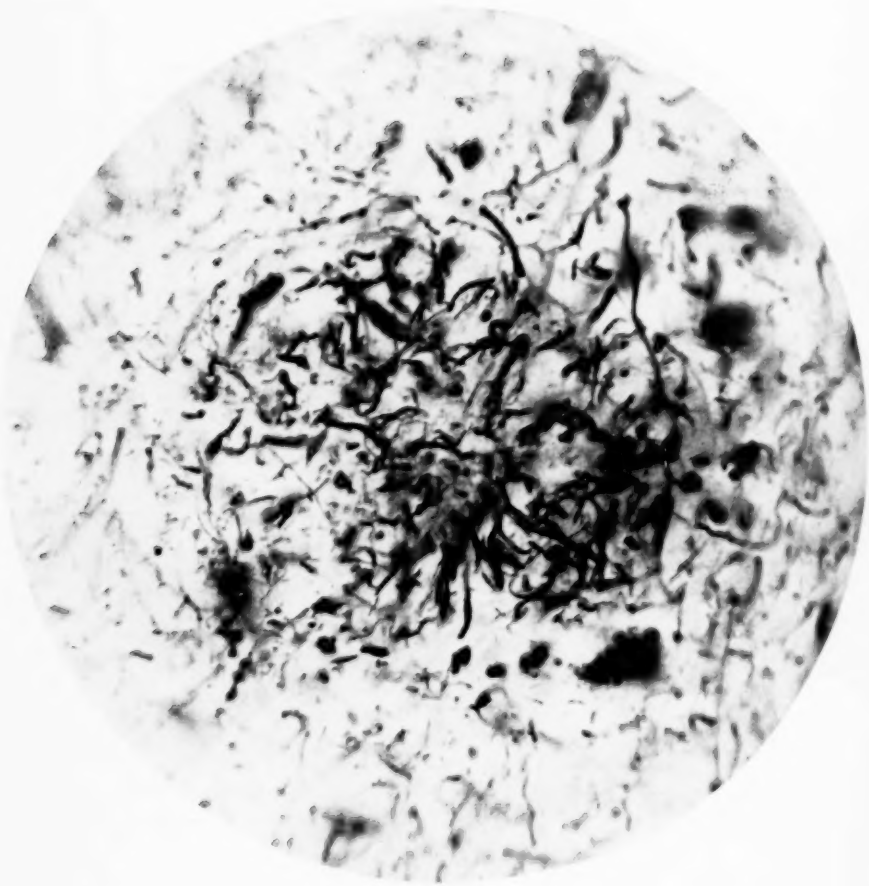


FIG. 10.

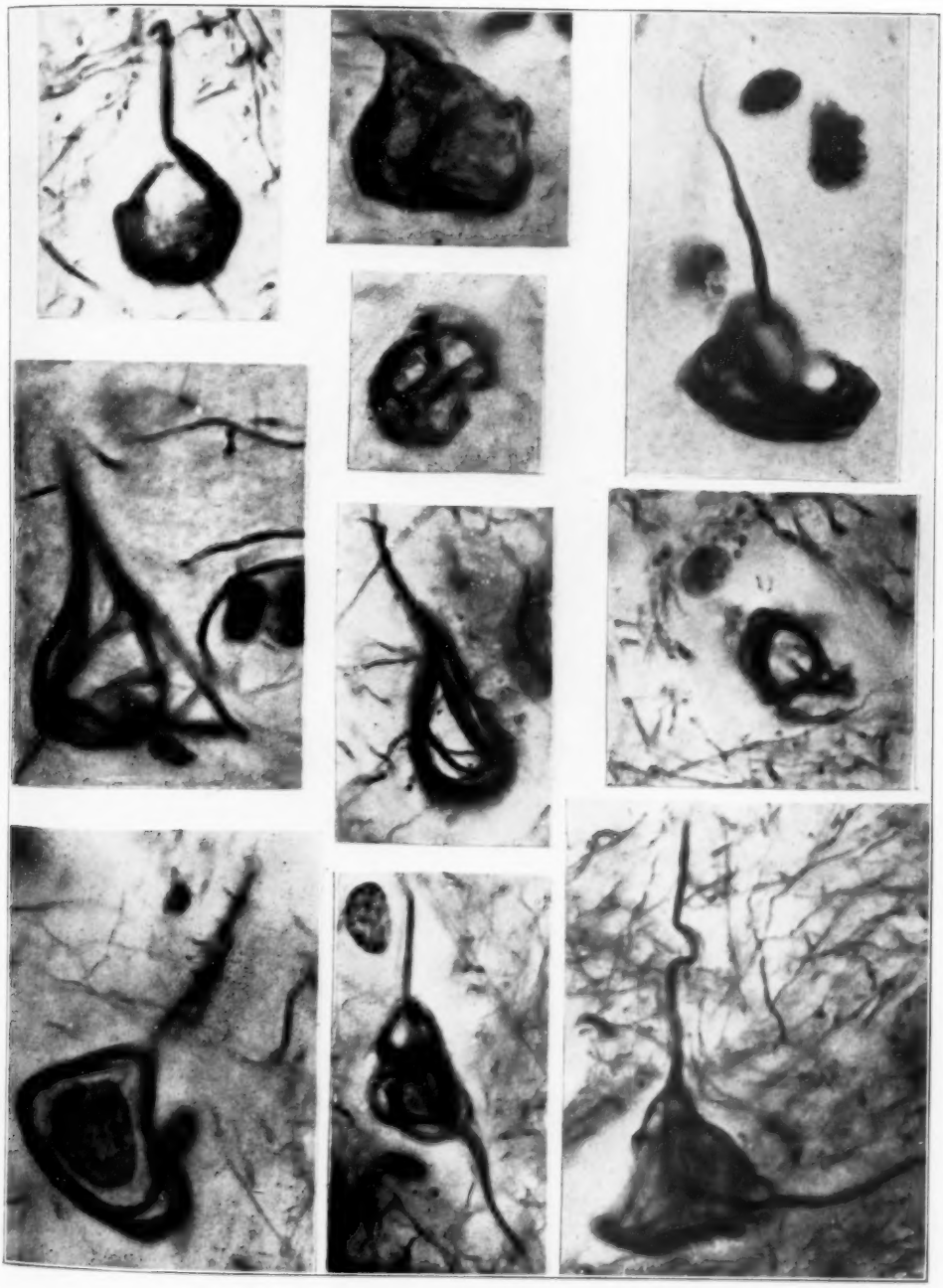


FIG. 11.

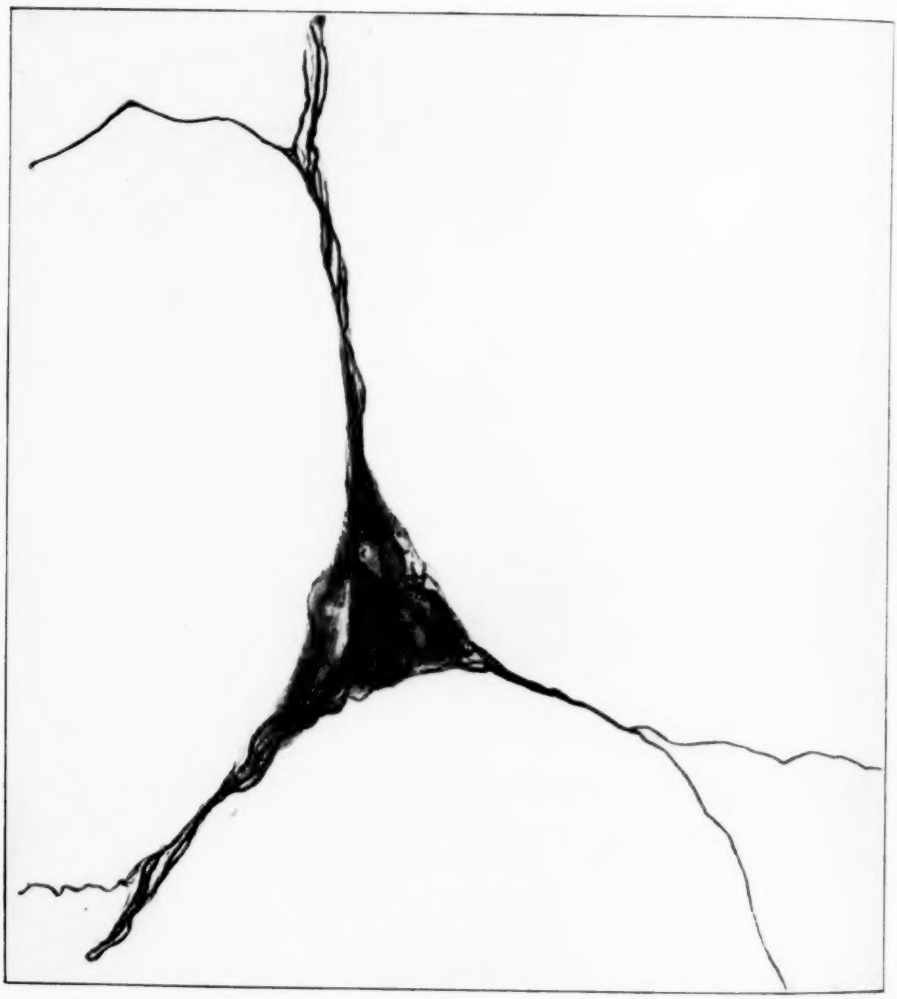


FIG. 12.

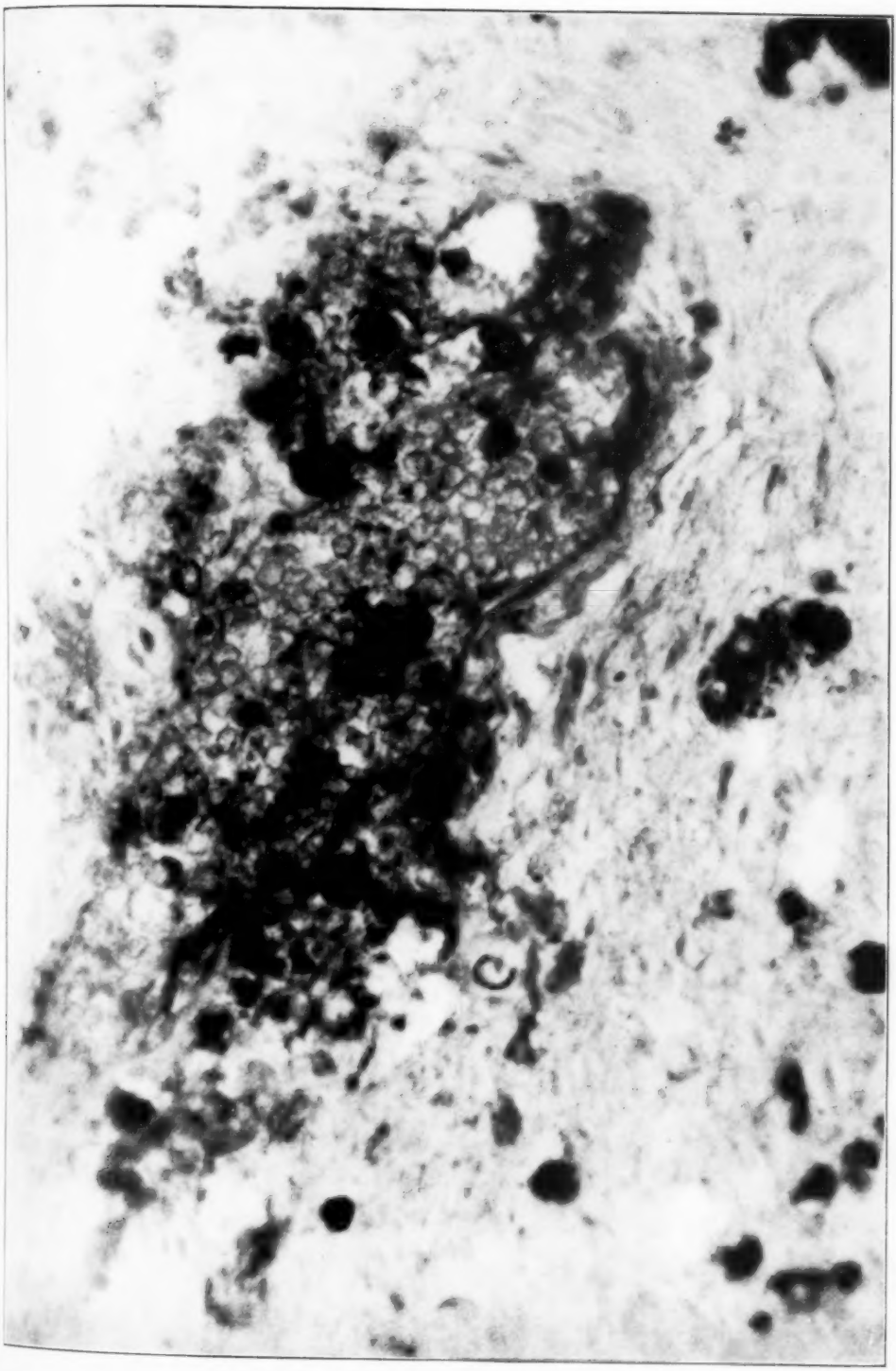


FIG. 13.

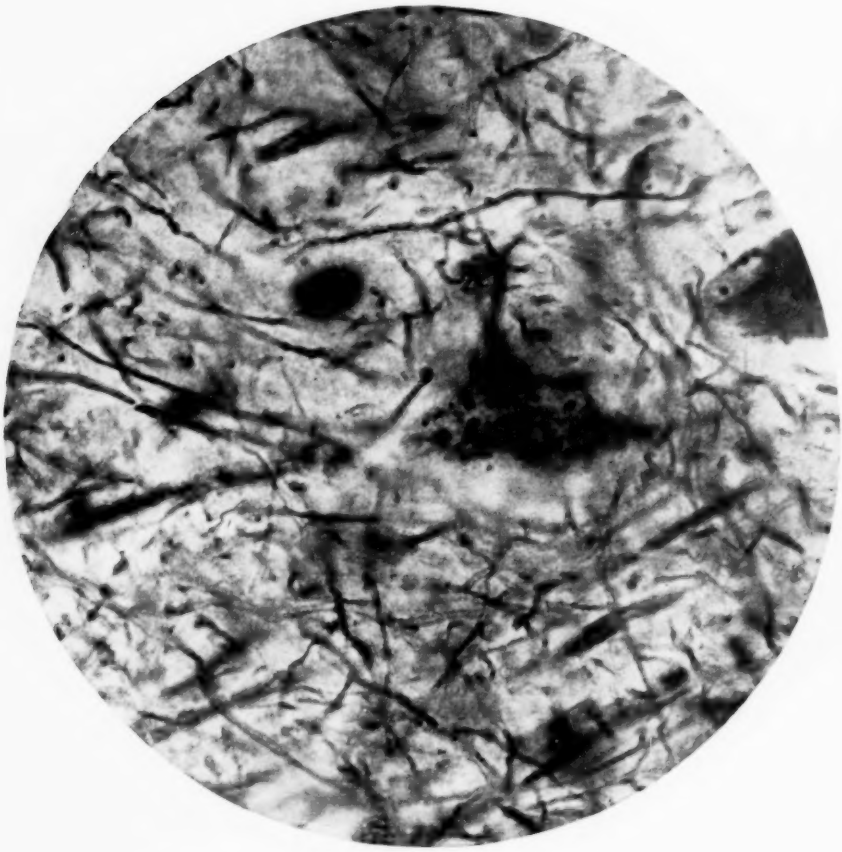


FIG. 15.

FIG. 14.

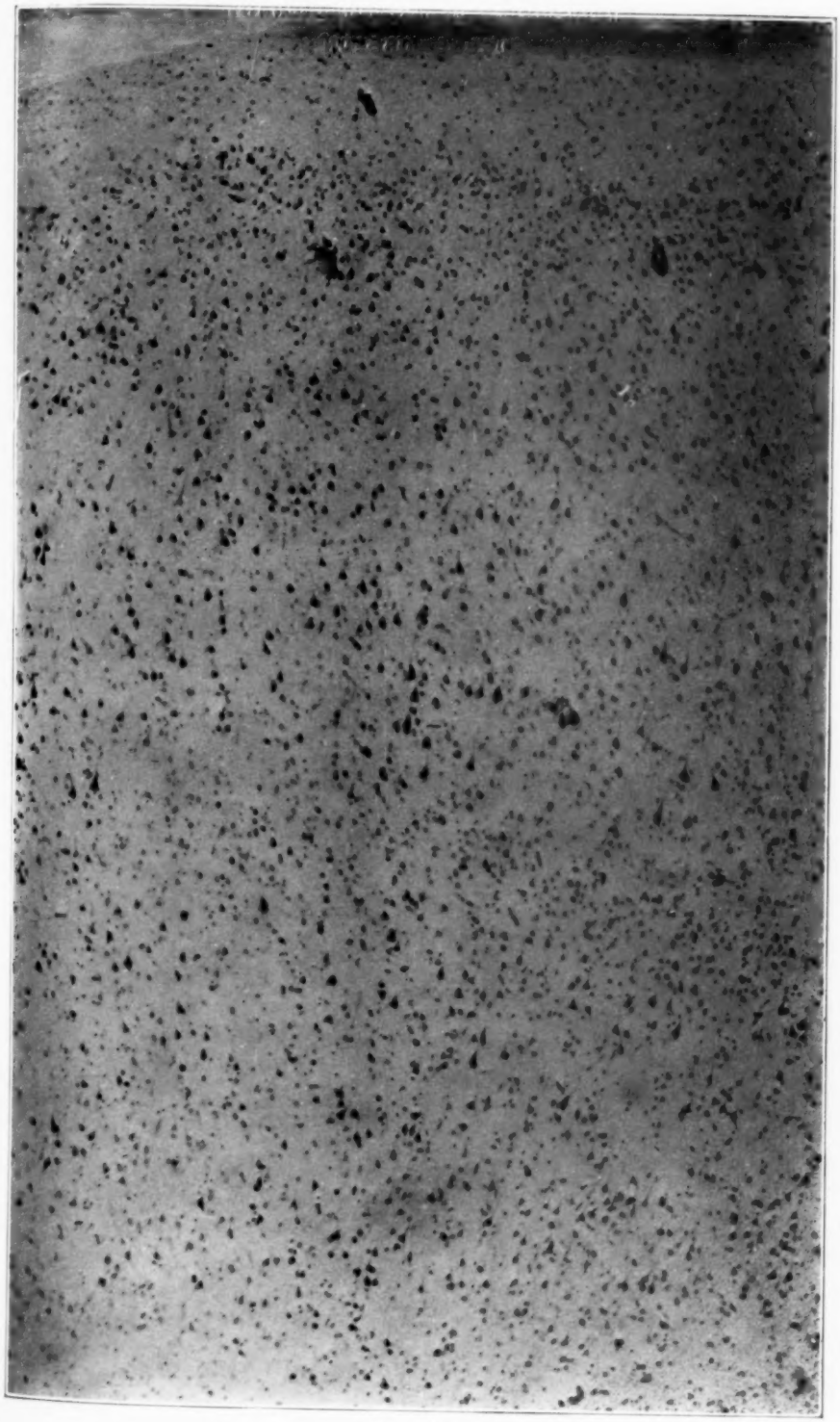


FIG. 16.

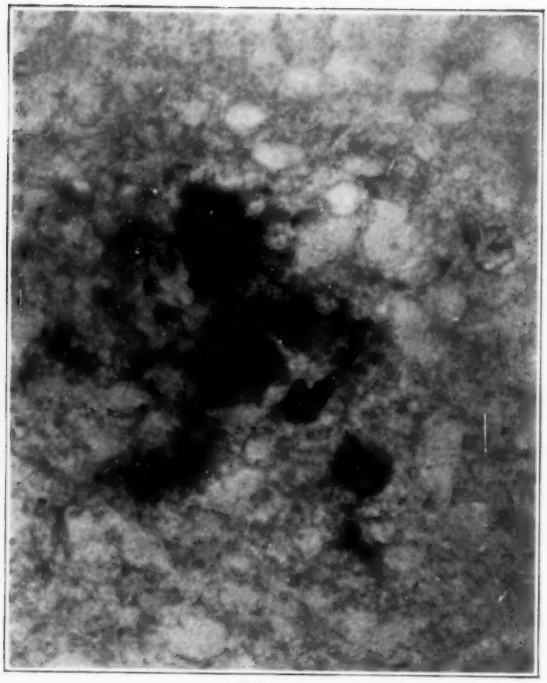


FIG. 17.

A STUDY OF HEREDITY IN INSANITY IN THE LIGHT OF THE MENDELIAN THEORY.

By A. J. ROSANOFF, M. D.,

AND

FLORENCE I. ORR, B. S.,

Kings Park State Hospital, Kings Park, N. Y.

From the earliest times physicians have recorded observations of the transmission of nervous diseases by heredity.

In modern times the accumulation of large amounts of material in the shape of clinical statistics published by hospitals has established beyond question the fact that heredity plays an essential part in the etiology of certain neuropathic conditions. Table I shows some statistical figures selected at random.

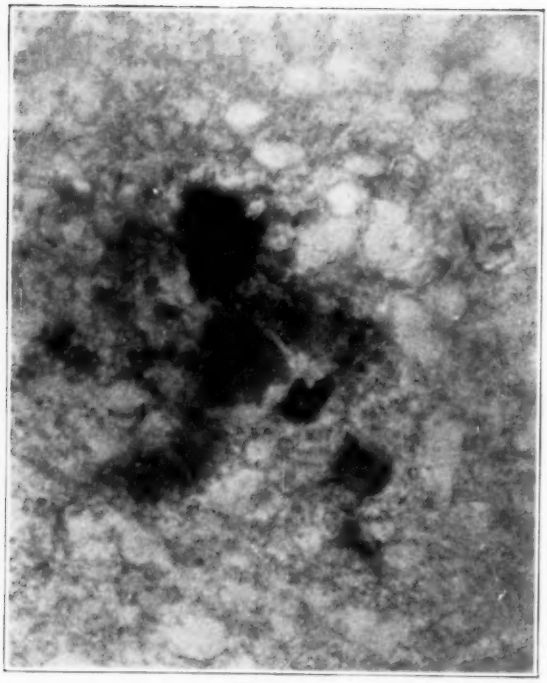
TABLE I.

	Total number of cases with known histories.	Cases showing heredity.	
		Number.	Per cent.
Report of New York State Commission in Lunacy for the year ending September 30, 1909.....	2,467	1,259	51.0
Report of Michigan Asylum for the Insane, at Kalamazoo, for the years 1859-1908.....	8,531	4,800	56.3
Report of Rhode Island State Hospital for the Insane for the year ending December 31, 1910.....	250	137	54.8

Figures such as these are for all forms of insanity, including those which occur on a basis of exogenous causes; yet even as they are, their significance becomes quite apparent when they are compared with figures representing the frequency of a neuropathic family history among normal subjects: 3 per cent according to Jost, 7.5 per cent according to Näcke.[1]

Aside from statistical data, studies of individual cases have revealed, on the one hand, the facts of atavistic and collateral heredity, and on the other hand, the fact of the frequent failure of transmission of neuropathic traits. In other words, there

[1] Cited by Kraepelin, *Psychiatrie*, 7th ed., Vol. I, p. 116.



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seemed to be no regularity in the working of heredity, and the generally accepted conclusion on the subject has been well voiced by Kraepelin: "We must therefore regard the statistics of heredity in insanity merely as facts of experience without finding in them the expression of a 'law' which should hold in every case."[2]

In recent years, however, it has been shown that human heredity, at least as far as certain traits are concerned, is subject to general biological laws. Special mention may be made of color of eyes,[3] color of hair,[4] form of hair,[5] brachydactyly,[6] some forms of cataract,[7] and retinitis pigmentosa,[8] as human traits which have been shown to be transmitted from generation to generation in accordance with the Mendelian theory.

As regards insanity and allied neuropathic conditions, the facts to which we have already referred, namely, the facts of atavistic and collateral heredity, direct heredity, and the frequent failure of transmission seem to point plainly to alternative inheritance. This suggests the likelihood of a mechanism of inheritance according with the Mendelian theory, and the present study has been undertaken with a view to determining whether indeed the neuropathic constitution is transmitted in the manner of a Mendelian trait.

§ 1. The Mendelian Theory.[9]

Perhaps a brief statement of the Mendelian theory will not be out of place here.

The total inheritance of an individual is divisible into unit characters, each of which is, as a general rule, inherited independently of all other characters and may therefore be studied without reference to them.

[2] *Loc. cit.*

[3] Davenport, *Science*, N. S., Vol. XXVI, Nov. 1, 1907. Hurst, *Proc. Roy. Soc.*, Vol. LXXX B., 1908.

[4] Davenport, *The Amer. Naturalist*, Vol. XLIII, Apr., 1909.

[5] Davenport, *Loc. cit.*, Vol. XLII, May, 1908.

[6] Farabee, *Papers of Peabody Museum*, III, 3, 1905.

[7] Nettleship, *Rep. Roy. London Ophth. Hosp.*, XVI, 1905.

[8] Nettleship, *Loc. cit.*, XVII, Parts I, II, and III.

[9] This section is for the most part reprinted from the Preliminary Report made shortly after the present study was begun. (Cannon and Rosanoff, *Jour. of Nerv. and Ment. Disease*, May, 1911.)

The inheritance of any such character is believed to be dependent upon the presence in the germ plasm of a unit of substance called a *determiner.*

With reference to any given character the condition in an individual may be *dominant* or *recessive*: the character is dominant when, depending upon the presence of its determiner in the germ plasm, it is plainly manifest; and it is recessive when, owing to the lack of its determiner in the germ plasm, it is not present in the individual under consideration.

The dominant and recessive conditions of a character are designated by the symbols D and R respectively.

Thus in the case of eye color the brown color is the dominant condition and the blue color is the recessive condition. In other words, the inheritance of brown eyes is due to the presence in the germ plasm of a determiner upon which the formation of brown pigment in the anterior layers of the irides depends, while the inheritance of blue eyes is due to the lack of determiner for brown pigment in the germ plasm, for the blue color of eyes is due merely to the absence of brown pigment, the effect of blue being produced by the choroid coat shining through the opalescent but pigment-free anterior layers of the irides in such cases.

It is obvious that as regards any character an individual may inherit from both parents—*duplex inheritance,* designated by the symbol DD,—or from one parent only—*simplex inheritance,* designated by the symbol DR,—or he may fail to inherit from either parent—*nulliplex inheritance,* designated by the symbol RR; in the last case the individual will exhibit the recessive condition.

We are now in a position to estimate the relative number of each type of offspring according to theoretical expectation in the case of any combination of mates.

There are but six theoretically possible combinations of mates. Continuing to make use of eye color as an instance of a Mendelian character, let us consider in turn each theoretical possibility.

1. Both parents blue-eyed (nulliplex): all the children will be blue-eyed, as may be shown by the following biological formula:

$$RR \times RR \propto RR.$$

2. One parent brown-eyed and simplex (that is to say inheriting the determiner for brown-eye pigment from one grandparent only), the other blue-eyed: one-half of the children will be brown-eyed and simplex and the other half blue-eyed:

$$DR \times RR \propto DR + RR.$$

3. One parent brown-eyed and duplex, the other blue-eyed: all the children will be brown-eyed and simplex:

$$DD \times RR \propto DR.$$

4. Both parents brown-eyed and simplex: one-fourth of the children will be brown-eyed and duplex, one-half will be brown-eyed and simplex, and the remaining one-fourth will be blue-eyed (nulliplex):

$$DR \times DR \propto DD + 2DR + RR.$$

5. Both parents brown-eyed, one duplex the other simplex: all the children will be brown-eyed, half duplex and half simplex:

$$DD \times DR \propto DD + DR.$$

6. Both parents brown-eyed and duplex: all the children will be brown-eyed and duplex:

$$DD \times DD \propto DD.$$

It will be seen from these formulæ that in attempting to predict the various types of offspring that may result from a given mating it is necessary to know not only whether the character is in each parent dominant or recessive, but in the case of the dominant condition also whether it is duplex or simplex.

Turning again to the example of eye color, a blue-eyed individual we know to be nulliplex, as he has no brown pigment in his eyes and therefore could not have inherited the determiner for brown-eye pigment from either parent. But how are we to judge in the case of a brown-eyed person whether he has inherited the determiner for that character from both parents or only from one? We can judge this only by considering the ancestry and offspring of the individual.

To put the whole matter in a nutshell, the essential difference between the dominant and the recessive conditions of a character lies in the fact that in a case of simplex inheritance the dominant condition is plainly manifest, while the recessive condition is not apparent and can be known to exist only through a study of ancestry and offspring.

This is important because it constitutes the criterion which enables us to determine whether any given inherited peculiarity or abnormality is, as compared with the average or normal condition, dominant or recessive.

§ 2. Description of Material.

The total amount of psychiatric material which is available at this hospital is very large. We found, however, that for various reasons, to be spoken of presently, the greater part of the material could not be utilized in our study.

In selecting cases our aim has been to exclude all those forms of insanity in the causation of which exogenous factors, such as traumata, alcoholism, and syphilis, are known to play an essential part; and we have also systematically excluded psychoses which occur upon a basis of organic cerebral affections, such as tumors, arteriosclerosis, apoplexy, and the like. We are not inclined to dispute the possible influence of heredity in these conditions; we have excluded them merely for the purpose of simplifying our problem by avoiding the necessity of dealing with a complicating factor in the shape of an essential exogenous cause. Moreover there seemed to be reason to believe that the so-called functional psychoses and neuroses are more closely related to each other than to the conditions which we have sought to exclude; and since our material had to be largely massed together for statistical treatment it was important that it should be as homogeneous as possible.

More than half the patients at this hospital are either themselves foreign born or the children of foreign-born parents; and among those who were born in this country of American parents there are many whose homes are in distant states; thus but a small proportion remained whose families had for two or three generations resided in this country and were accessible to investigation.

Other difficulties in obtaining our data were due to the ignorance of some of our informants or to their reluctance or refusal to co-operate in the investigation; and in many cases the investigation had to be discontinued and the data already collected had to be discarded owing to incompleteness.

In the actual analysis of the data collected in the course of our investigation the problem in each case was to distinguish, on the

basis of the information obtained by questioning the relatives, neuropathic states from the normal state and in the case of a neuropathic state to identify, if possible, the special variety. Such diagnosis often enough presents great difficulty when there is opportunity for direct observation, but when it has to be based upon observations of untrained informants related from memory the difficulty is, of course, greatly increased and with it the chance of error. We have endeavored to reduce the amount of error from this source by interviewing personally as many as possible of the nearest relatives of the patients whose pedigrees were being investigated, and by the practice of tracing almost all the families not farther than to the generation of grandparents, for the farther back our inquiries extended the more scant and more vague was the information which we were able to obtain.

To the difficulty of diagnosis is added the further difficulty which results from the impossibility in the present state of psychiatry of precisely delimiting the conception of the neuropathic constitution. To this matter we shall have occasion to revert in subsequent sections.

In the analysis of data it was often necessary in the case of a normal subject to determine whether the case was one of duplex or of simplex inheritance, it having appeared early in the course of our study that the normal condition was dominant over the neuropathic condition. The fact of simplex inheritance we were able in some cases to establish on the basis of the existence of neuropathic manifestations in the ancestors or collateral relatives of the subject; in other cases this evidence was lacking as our information did not extend to the more remote generations, so that it was necessary to *assume* the fact of simplex inheritance on the basis of the existence of neuropathic offspring: the two types of material have been treated separately. On the other hand, the fact of duplex inheritance was in every case based upon the absence of neuropathic manifestations in ancestors and collateral relatives, as far as known, as well as in the offspring;—but inasmuch as in scarcely any case was the family history traced farther back than the third generation it is clear that the possibility of simplex inheritance was in no case positively excluded; we have here, therefore, another source of error which, fortunately, is slight, and affects the least important part of our mate-

rial, namely, the cases of matings from which no neuropathic offspring have resulted.

On the whole, no pretension is made here of total elimination of error; but we believe that whatever errors remain they are not sufficient to invalidate the material as a basis for our study.

§ 3. Statistical Analysis of Material.

In the Preliminary Report, to which we have already referred and which was based upon an analysis of the pedigrees of twelve families, it was shown that the neuropathic constitution is transmitted by heredity probably in the manner of a trait which is, in the Mendelian sense, recessive to the normal condition.

Sixty other families have since been investigated; the entire material now includes the pedigrees of seventy-two families, representing two hundred and six different matings, with a total of one thousand and ninety-seven offspring. In Table II this mass of data has been arranged so as to show the proportions of normal and neuropathic offspring which resulted from the various types of mating alongside of figures representing theoretical expectation according to the Mendelian theory.

TABLE II.

Types of mating.	Number of matings.	Total number of offspring.	Died in childhood.	Data unascertained.	Neuropathic offspring.		Normal offspring.	
					Actual findings.	Theoretical expectation.	Actual findings.	Theoretical expectation.
a. RR × RR ∞ RR	17	75	11	0	54	64	10	0
b. DR × RR ∞ DR + RR	37	216	46	1	84	84½	85	84½
b_1. " " " "	56	284	20	4	106	130	154	130
c. DD × RR ∞ DR	14	61	13	3	0	0	45	45
d. DR × DR ∞ DD + 2DR + RR	7	34	5	0	8	7¼	21	21¾
d_1. " " " "	55	335	39	3	99	73¾	194	219¾
e. DD × DR ∞ DD + DR	20	92	12	3	0	0	77	77
f. DD × DD ∞ DD	0	0	0	0	0	0	0	0
Totals	206	1,097	146	14	351	359	586	578

Some of the data represented in the table require special explanation.

Among the offspring which resulted from matings of the first type, RR × RR, ten are recorded as being normal, although

theoretically all should be neuropathic. Of these ten one died at the age of thirty-eight years in an accident, during life suffered from asthma, had a son who died in convulsions; another is described as being easy going, is somewhat odd and possibly abnormal in make-up, is twenty-nine years of age; the rest are from eight to twenty-two years of age. In other words, in two of the ten subjects the neuropathic constitution is not positively excluded and the remaining eight have not reached the age of incidence.

The matings of the second and fourth types, DR × RR and DR × DR respectively, have been divided into two groups each, as already explained in the preceding section: thus groups *b* and *d* in the chart include the matings in which the simplex condition of either or both mates, as the case may be, is definitely ascertained, the existence of neuropathic manifestations either in ancestors or in collateral relatives of the subjects appearing in the pedigrees; groups b_1 and d_1, on the other hand, include the matings in which the simplex condition of either or both mates is assumed to exist on the basis of the character of the offspring. It is perhaps not surprising that groups b_1 and d_1 are larger than *b* and *d* respectively when we consider the great likelihood of a neuropathic taint, derived from an ancestor of a remote generation, being transmitted many times in the shape of a simplex condition, and at the same time the fact that our investigations extended in almost all cases no farther back than the generation of grandparents.

As is shown in the table the correspondence between theoretical expectation and actual findings is in some cases exact and in all cases remarkably close. *It would seem, then, that the fact of the hereditary transmission of the neuropathic constitution as a recessive trait, in accordance with the Mendelian theory, may be regarded as definitely established.*

The material represented in the table appears elsewhere in this paper in the shape of pedigree charts with detailed references to all neuropathic individuals. Among the subjects who have been counted as neuropathic were, on the one hand, those who were recognized as insane, epileptic, hysterical, or feeble-minded, and on the other hand, those who presented anomalies of conduct or disposition which were even in the conservative judgment of our

lay informants related to the neuropathic conditions. At the same time we have counted as normal all cases of mental or nervous disturbance resulting from arteriosclerotic disease with strokes, paralyses, aphasias, etc.

§ 4. Dissimilar Heredity. Degrees of Recessiveness.

Heretofore we have dealt with the neuropathic constitution as a unit, comparing it with the normal condition. The great variety of neuropathic manifestations and the facts of dissimilar heredity show, however, that the neuropathic constitution in reality consists of a series of entities which are distinct, at least from the standpoint of clinical definition, though at the same time evidently in some manner related to each other.

The phenomenon of dissimilar heredity has, indeed, in the opinion of some cast a doubt upon the validity of conclusions which are in part based upon the assumption of the existence of an essential relationship between the most diverse clinical neuropathic manifestations. It must be admitted that the burden of proof rests upon those who assume that imbecility, epilepsy, deteriorating psychoses, periodic psychoses, paranoic conditions, involutional psychoses, the slighter psychopathic states, and certain eccentricities are all etiologically related. It is for them to explain why the neuropathic constitution leads in some cases to death from convulsions in early childhood, and in others to but a transitory depression at the involutional period, the subject being at least approximately normal during the greater part of his life. It is for them to explain why in some cases there is profound congenital mental defect, in others a dementing process coming on in early adult life, in still others recurrent but non-dementing insanity, and in others again a mere predisposition to mental disturbance which for many years remains latent and is brought to light only through the operation of some external cause.

Some parts of our material seem to throw some light upon the nature of the relationship which exists between various neuropathic manifestations. Thus the pedigree charts of at least four families point to the existence of *different degrees of recessiveness*. In other words, certain neuropathic conditions, though clearly recessive as compared with the normal condition, are at the same time dominant over other neuropathic conditions which

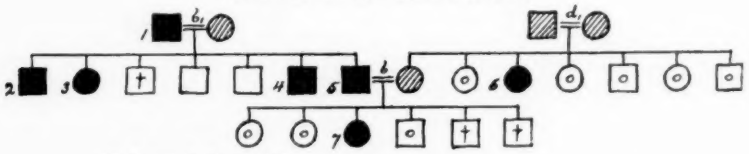
are, so to speak, of a more pronounced degree of recessiveness. It appears in a most marked way that recoverable psychoses are dominant over epilepsy and allied conditions.

It seems necessary to assume that the normal development and function of the nervous system is dependent not upon a single unit determiner in the germ plasm, but upon a group of determiners, and that the number of units lacking from that group determines the special type of defect to be observed clinically. It may be recalled that a similar assumption has been found necessary for the understanding of the inheritance of other Mendelian characters, notably various shades of skin pigmentation.[10]

For convenience in presentation conditions of slighter degree of recessiveness, like recoverable psychoses, may be designated by the capital letter R, and those of more pronounced degree of recessiveness, like epilepsy, by the small letter r.

In Chart I [11] we find an instance of the union of a manic-depressive subject, of a family heavily tainted with manic-depressive

CHART I. L. R. CASE NO. 4215.



1. Insane before death.
2. "Nervous prostration," in sanitarium four weeks, recovered.
3. Manic-depressive insanity, in State hospital.
4. Manic-depressive insanity, in State hospital.
5. Manic-depressive insanity, in State hospital.
6. Epilepsy, in State hospital.
7. Manic-depressive insanity, in State hospital.

insanity, with a mate who is normal but who carries the taint of epilepsy. That mating may be represented by the following formula:

$$RR \times Dr \infty DR + Rr.$$

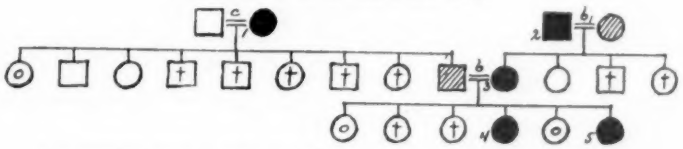
[10] Davenport. *Heredity of Skin Pigment in Man.* The American Naturalist, Vol. XLIV, Nov. and Dec., 1910.

[11] In all charts the following symbols have been employed: a square indicates a male subject; a circle indicates a female subject; □ or ○ = normal subject with normal progeny; ⊡ or ⊙ = normal subject without progeny; ◪ or ◍ = normal subject with neuropathic progeny; ■ or ● = neuropathic subject; ⊞ or ⊕ = subject died in childhood; ⍰ or ⍰ = data unascertained. The type of mating is in each instance indicated by a small letter: *a*, *b*, b_1, *c*, *d*, d_1, *e*, as in Table II.

In other words, the offspring from such a mating may be either normal or manic-depressive, but not epileptic,—and such in fact was the actual result as shown in the chart.

In Chart II we find an instance of the union of a normal subject, whose mother suffered from a psychosis described by our

CHART II. M. S. CASE NO. 6558.



1. Hysterical when a girl; had idea someone was trying to poison her.
2. Epilepsy.
3. Epilepsy.
4. Manic-depressive insanity, in State hospital.
5. Very nervous.

informant as being in the nature of hysteria, with an epileptic mate whose father was also epileptic. That mating may be represented by the following formula:

$$DR \times rr \infty Dr + Rr.$$

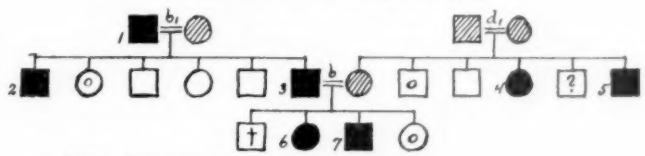
In other words, the offspring from such a mating may be either normal or having a psychosis recoverable in its nature and possibly resembling hysteria, but not epileptic; the chart shows that of the six offspring two died in childhood, two were normal, one had manic-depressive insanity, and one was "very nervous," but none were epileptic.

Similarly in Chart III we find a mating which may be represented by the following formula:

$$RR \times Dr \infty DR + Rr.$$

Of the four offspring one died in childhood, one was normal, one had manic-depressive insanity, and the remaining one is de-

CHART III. B. S. CASE NO. 7002.



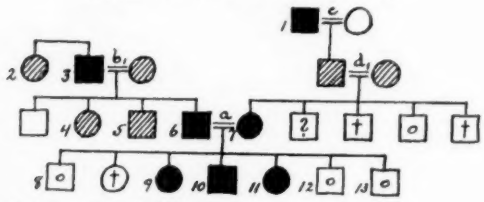
1. Senile deterioration.
2. Crank.
3. Recurrent melancholia with insomnia; five months in sanitarium.
4. Convulsions in childhood.
5. Convulsions in childhood.
6. Easily excited, nervous temperament.
7. Manic-depressive insanity, in State hospital.

scribed as being easily excited and of nervous temperament, but none had convulsions or epilepsy.

Finally in Chart IV we have an instance of the union of an epileptic subject, of a family tainted with epilepsy, with a mate who suffered from recurrent attacks of depression with insomnia; this mating may be represented by the following formula:

$$rr \times RR \propto Rr.$$

CHART IV. F. M. S. CASE NO. 6432.



1. Alcoholic, died from acute alcoholism.
2. Had feeble-minded, queer, insane daughter.
3. "Money mad," very cruel, very miserly though wealthy, left much of his money to housekeeper.
4. Daughter had fainting spells.
5. Has feeble-minded, queer son.
6. Fainting spells.
7. Recurrent attacks of depression.
8. 22 years old.
9. Recurrent attacks of depression, several suicidal attempts, in State hospital.
10. Manic-depressive insanity, in State hospital.
11. Attack of depression with suicidal tendency; recovery after three months.
12. 20 years old.
13. 15 years old.

In other words, all the offspring from such a mating should be neuropathic, suffering from a recoverable psychosis, but not from fainting spells or any other epileptic manifestation. The chart shows that of the seven offspring which resulted one died in childhood, three were normal being between fifteen and twenty-two years old,—probably below the age of incidence,—and the remaining three suffered from recoverable psychoses, but not from epilepsy.

It is probable that there are many degrees of recessiveness, but there is a great deal of evidence to show that degrees of recessiveness do not account for all varieties of clinical neuropathic manifestations.

§ 5. Neuropathic Equivalents.

In studying any neuropathic defect one must bear in mind that its clinical manifestations will vary with the personality of the subject and with conditions of environment. It is indeed a

notorious fact that most of the so-called clinical entities are remarkable for the variety of their manifestations. This fact has necessitated the introduction in clinical practice of the conception of neuropathic equivalents. Thus notably in epilepsy it has long been found necessary to bring together such manifestations as fainting spells, convulsive seizures, psychical attacks, brief absences, spells of automatism, periodic dipsomania, etc.

More recently Kraepelin has shown that certain depressions, manias, circular and mixed states are but various phases of the same underlying constitutional disorder analogous to the various equivalents of epilepsy.[12] And Dreyfus has been able to establish the fact that the anxious depressions of the involutional period are but a special variety of manic-depressive insanity.[13]

Similarly, in one immense group, under the general heading of dementia præcox we now, following Kraepelin, include such widely contrasted conditions as simple hebephrenia, catatonia, and *délire chronique à évolution systématique*—conditions which were long regarded as independent clinical entities.

Thus in clinical psychiatry progress has been marked by a simplification of classification through a far-reaching extension of the conception of clinical equivalents.

Some of the data furnished by our material seem to indicate the necessity for a still further extension of this conception. It is interesting to note that what we learn in institutional experience to recognize as insanity is a comparatively uncommon group of manifestations of the neuropathic constitution, for of our total of 437 neuropathic subjects (not counting the 21 who died in convulsions in early childhood) only 115, or 26.3 per cent, presented at any time in their lives indications for commitment to sanitariums or hospitals for the insane; moreover, it is obvious, where the facts are known in detail, that in most cases in which such indications have occurred they were in the shape of special reactions to special environmental conditions; and it seems equally obvious that our definition of the various types of neuropathic constitution must be in terms not of such special reactions, but rather of the more stable and more general underlying psychical traits and tendencies.

[12] Kraepelin, *Psychiatrie*, 7th ed., Vol. II, p. 558.

[13] Dreyfus, *Die Melancholie, ein Zustandsbild des manisch-depressiven Irreseins*, Jena, 1907.

Thus in families of patients suffering from manic-depressive insanity we find not only subjects clearly recognized as insane, but also subjects described as follows: high-strung, excitable; dictatorial, abnormally selfish; awful temper; periodic drinker, a demon when drunk; committed suicide; had severe blue spells.

In the pedigrees of cases of dementia præcox we find ancestors and collateral relatives described in the following significant terms: cranky, stubborn; worries over nothing; religious crank; nervous, queer; restless, has phobias; suspicious of friends and relatives.

And in the families of epileptics we find, besides cases of actual epilepsy or convulsions in infancy, also cases of hemicrania, recurrent sick headaches, fainting spells, nervous fidgety make-up, and the like.

The limits of the legitimate extension of the conception of equivalents thus seem to be beyond even the widest limits established by clinical definition.

It is not to be assumed, however, that members of the same family necessarily suffer from the same neuropathic defect in the shape of various clinical equivalents, for even brothers and sisters, children of the same parents, may suffer from neuropathic defects representing not equivalents but different degrees of recessiveness. Theoretically there is, in fact, only one combination of mates of which all neuropathic offspring will necessarily suffer from equivalent defects. The third, fifth, and sixth combinations ($RR \times DD$, $DR \times DD$, and $DD \times DD$) need not be considered at all in this connection as from them no neuropathic offspring will result. But let us consider the remaining three combinations ($RR \times RR$, $RR \times DR$, $DR \times DR$) from which neuropathic offspring may result.

If it is true that neuropathic defects may represent different degrees of recessiveness, as we have endeavored to show in a preceding section, then in the case of any neuropathic subject we have no way of telling whether the inheritance of his defect is homozygous or heterozygous, unless we possess an exceptionally detailed pedigree extending far back to past generations; in other words, we cannot tell whether he inherits from the two parents defects of the same or of different degrees of recessiveness. Continuing to make use of the symbols R and r to represent, re-

spectively, lesser and more pronounced degrees of recessiveness, a given neuropathic condition may accordingly be represented either by the symbol RR or Rr; and similarly the condition of a normal subject who represents simplex inheritance, *i. e.*, who inherits the neuropathic taint from one parent, may be represented either by the symbol DR or Dr. It may be readily seen, then, that in the case of either the first or second combination there are possibilities of offspring with more than one type of neuropathic defect, *i. e.*, of defects of different degrees of recessiveness, as may be shown by the following formulæ:

1. $Rr \times Rr \propto RR + 2Rr + rr.$
   $Rr \times rr \propto Rr + rr.$
2. $Rr \times Dr \propto DR + Dr + Rr + rr.$

The neuropathic conditions in the children resulting from such matings would not necessarily be equivalents.

But in the case of the fourth type of mating, that of two simplex individuals, *i. e.*, two individuals who are normal but carry the taint from their ancestors, the neuropathic offspring which may result would in any instance show defects which are theoretical equivalents; for from every theoretically possible variety of combination only one type of neuropathic offspring can result, as may be shown by the following formulæ:

$$DR \times DR \propto DD + 2DR + RR.$$
$$DR \times Dr \propto DD + DR + Dr + Rr.$$
$$Dr \times Dr \propto DD + 2Dr + rr.$$

Clinical manifestations will, of course, vary with the personality of the subject, the age at which the disorder makes its appearance, the nature of the exciting cause, and other environmental conditions; but in spite of such variations we are able, in the light of a better knowledge of the mechanism of heredity, to identify neuropathic equivalents at least when they occur in brothers and sisters who are the offspring of the matings of the fourth type.

In matings of this type only one-fourth of all the offspring, on the average, exhibit the neuropathic condition; therefore most such families have not more than one neuropathic subject and do not afford an opportunity of comparing neuropathic equivalents; but many large families, or some in which by an unlucky chance more than one neuropathic subject has resulted, do afford

such an opportunity, and *thus a new aid for the study of neuropathic equivalents becomes available.*

In our own material the pedigree charts from V to XXIX present instances of matings of the fourth type from each of which two or more neuropathic offspring have resulted. Comparisons of the brothers and sisters in these families reveal points of rather peculiar interest.

In some instances the manifestations clinically observed were either similar or identical; such instances are to be found in Charts VII, IX, XV, XVI, XVII, XX, XXIII, and XXV.

In other instances we find well defined psychoses alongside of cases presenting oddities of conduct or of disposition which are familiar to physicians as types of make-up constituting the characteristic soil upon which the psychoses develop.[14] Thus in Chart XV we find a case of dementia præcox, in a brother "nervous hysteria when his sister died, had hallucinations of sight and hearing, was disturbed and had to be restrained," and in a sister "nervous temperament, easily excited, has weak spells." In Chart XXI we find in one case "nervous breakdown early in life, was unable to work, recovered," in a sister "awful temper." In Chart XXVI we find in one case the following note: "insane twice, very disturbed, recovered each time," and in a sister "odd, nervous temperament, easily excited." In Chart XXVIII we find a subject who was "insane a few months before death," in one sister "melancholy disposition, had nervous prostration," and in another sister "nervous temperament, melancholy."

Perhaps the most striking finding is that of fainting spells or convulsions in childhood alongside of dementia præcox; this occurs in Charts V, VI, VIII, XI, and XII. In this connection may be recalled the rather frequent occurrence of seizures of various sorts in dementia præcox—fainting spells, epileptiform convulsions, muscle spasms, etc.: according to Kraepelin in 18 per cent of all cases.[15]

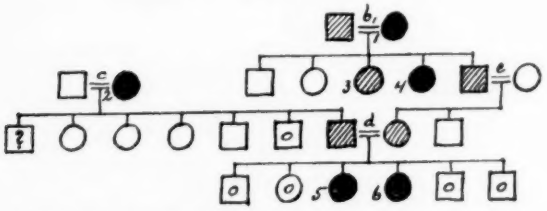
Finally we would point out the occurrence, as neuropathic

[14] Aug. Hoch, *Constitutional Factors in the Dementia Præcox Group*, Rev. of Neurol. and Psychiatry, Aug., 1910.—Ed. Reiss, *Konstitutionelle Verstimmung und manisch-depressives Irresein*, Zeitschr. f. d. gesamte Neurol. u. Psychiatrie, Vol. II, p. 600, 1910.

[15] Kraepelin, *Psychiatrie*, 7th ed., Vol. II, p. 188.

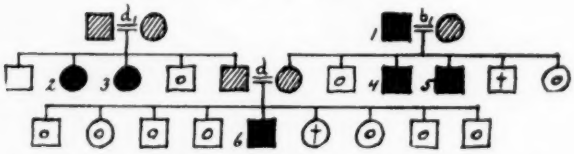
equivalents, of conditions which are clinically altogether dissimilar. For instance, in Chart XVII one subject is noted as having been "insane during pregnancy with second child, recovered," and her sister as a "religious recluse, nun in convent in Australia": perhaps in this instance the difference between the married state and celibacy accounts for the difference in manifestations. In Charts XIX and XXVII we find cases of senile deterioration related to peculiar psychoses occurring earlier in life; in one case we find the following note: "When a girl went to Washington, lost her money, could not tell why she went there, was placed in an institution; says a man has 'witched' her; has in her pocket a bottle of gin which she takes 'for blood poison'"; —in another case: "Irritable in early years of marriage, had hysterical spells, ill-treated her step-children";—and in a third case: "Nervous after sister's death, was too nervous to be interviewed or visited by anyone." In Charts XXII and XXIX the following cases are associated as family equivalents with epilepsy: "Moderately alcoholic, ideas of persecution against relatives"; —"Loquacious, rambling, odd, had severe attacks of depression following childbirth";—"Subject to spells of severe depression";—"Seems to have lost interest in life, when interviewed would say only 'I know nothing more than sister told you'";—"Moderately alcoholic, never settled down to anything but roamed around all his life until he died at the age of 62 years of pneumonia." It should be pointed out here that in classifying the matings there is always a possibility of error especially in the direction of overlooking neuropathic traits and, owing to misinformation or misjudgment of our informants, counting one or both mates as normal who should properly be counted as neuropathic. Thus in individual instances matings classified as belonging to the fourth type (DR×DR) may in reality be of the second type (RR×DR), in which case, as already shown, the neuropathic offspring may present defects of different degrees of recessiveness and not necessarily equivalents. Errors could be guarded against only with the aid of a large amount of material; in other words *any two dissimilar neuropathic manifestations should not be definitely classed as equivalents unless they are repeatedly met with in brothers and sisters of a large number of families resulting from matings of the fourth type.*

CHART V. F. R. CASE NO. 6893.



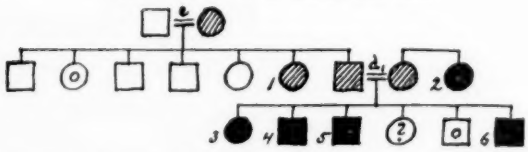
1. Died insane in State hospital.
2. Hysterical spells for about three years.
3. One daughter insane, in State hospital.
4. Insane, in State hospital, recovered, insane again at 76 years.
5. Died in convulsions in childhood.
6. Dementia præcox, catatonic, in State hospital.

CHART VI. E. C. CASE NO. 7048.



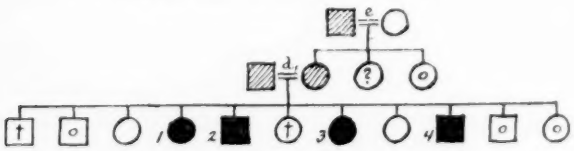
1. Nervous temperament, easily excited, moderately alcoholic.
2. Nervous, erratic, excitable.
3. Fainting spells.
4. Nervous temperament, easily excited.
5. Easily excited, moderately alcoholic.
6. Dementia præcox, catatonic, in State hospital.

CHART VII. J. C. CASE NO. 2921.



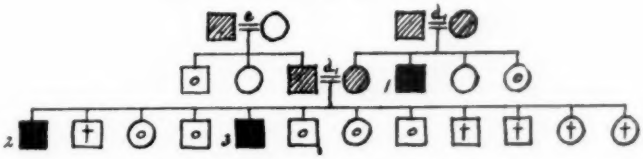
1. Daughter was sister of mercy in Australia; is said to have died of homesickness.
2. Feeble-minded, eccentric, laughs without cause, says "I don't know" in reply to simple questions.
3. Died insane at asylum in Cork.
4. Was insane at asylum in Cork; was discharged improved but is still queer.
5. Dementia præcox, at State hospital.
6. Dementia præcox, at State hospital.

CHART VIII. T. H. CASE NO. 6330.



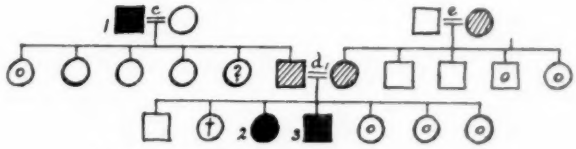
1. Nervous temperament, fidgety, has nervous son.
2. Dementia præcox, paranoid, in State hospital.
3. Convulsions following small-pox at the age of 5 years.
4. Died in convulsions at the age of 1 year.

CHART IX. M. O'T. CASE NO. 6115.



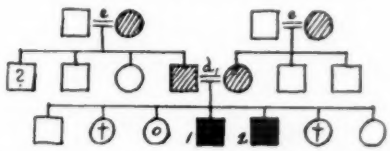
1. Very irritable, violent temper.
2. Dementia præcox, in State hospital.
3. Dementia præcox, in State hospital.

CHART X. R. M. CASE NO. 6459.



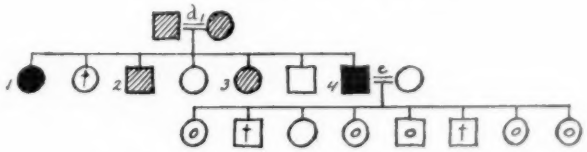
1. Quick tempered.
2. Became melancholy due to disappointment.
3. Dementia præcox, paranoid, in State hospital.

CHART XI. F. S. CASE NO. 6492.



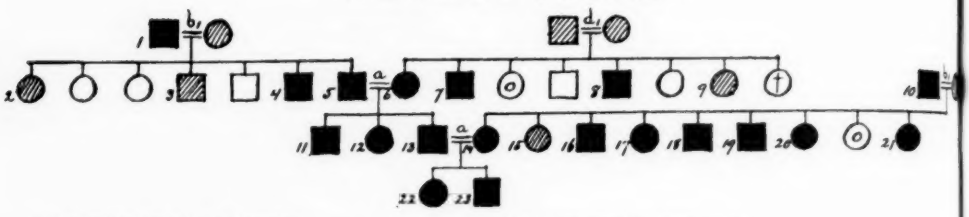
1. Dementia præcox, paranoid, in State hospital.
2. Died of convulsions during teething in childhood.

CHART XII. E. H. CASE NO. 01655.



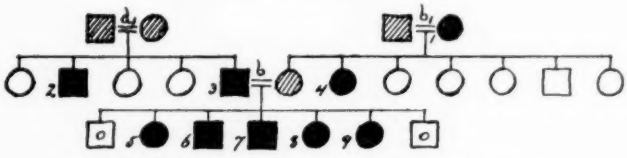
1. Fainting spells.
2. Son has dementia præcox, in State hospital.
3. Daughter has fainting spells.
4. Dementia præcox, simple, in State hospital.

CHART XIII. M. H. CASE NO. 6323.



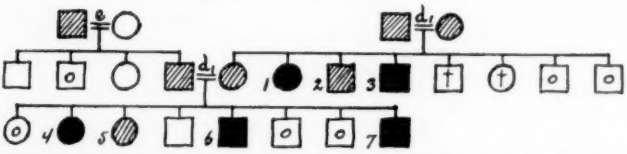
1. Committed suicide by hanging.
2. One daughter insane, another eccentric.
3. One son mentally defective.
4. Alcoholic.
5. Eccentric, quick-tempered, "crazy John."
6. Eccentric, traveled about alone at night, slept through the day.
7. Alcoholic, left his family.
8. Committed suicide by hanging.
9. Daughter committed suicide.
10. Nervous temperament, easily upset.
11. Nervous temperament, "fretter," son was insane and recovered.
12. Nervous temperament, son nervous.
13. Very peculiar, eccentric.
14. Epileptic.
15. One son mentally defective.
16. Nervous temperament, queer in spells, eccentric.
17. Eccentric, begs gloves, handkerchiefs, etc., without need.
18. Nervous temperament.
19. Alcoholic, nervous temperament.
20. Nervous.
21. Eccentric, never associated with anyone, lived year round in outside kitchen.
22. Dementia præcox, paranoid, in State hospital.
23. Nervous temperament, easily excited, easily upset daughter also nervous and excitable.

CHART XIV. J. H. CASE NO. 7055.



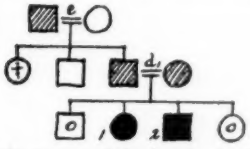
1. Senile deterioration.
2. Very alcoholic, died at age of 40 years of "paralysis."
3. Violent temper, ideas of persecution against friends.
4. Was nervous following the birth of first child, recovered.
5. Very nervous temperament.
6. Nervous breakdown several times.
7. Dementia præcox, catatonic, in State hospital.
8. Nervous temperament.
9. Nervous temperament.

CHART XV. F. E. CASE NO. 7183.



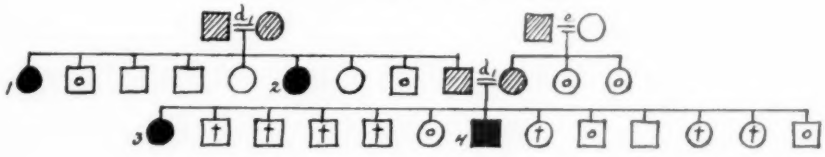
1. Nervous, little things bothered her, worried a great deal; her daughter was nervous and melancholy.
2. Son had convulsions in childhood.
3. Excitable, nervous, worries.
4. Nervous temperament; easily excited; has "weak spells."
5. Daughter had convulsions in childhood.
6. Dementia præcox, paranoid, in State hospital.
7. Had "nervous hysteria" when his sister died; had hallucinations of sight and hearing; was disturbed and had to be restrained.

CHART XVI. H. M. CASE NO. 6672.



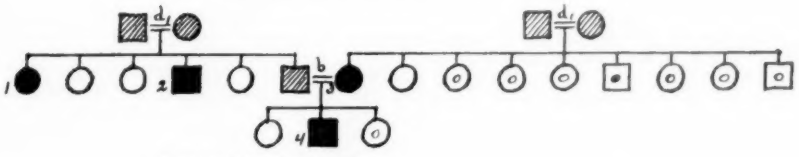
1. Dementia præcox, hebephrenic, in State hospital.
2. Dementia præcox, simple, in State hospital.

CHART XVII. D. H. CASE NO. 6699.



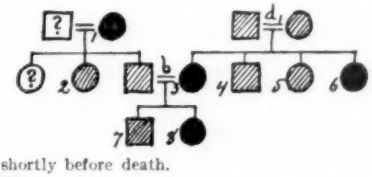
1. Insane during pregnancy with second child, recovered.
2. Nun in convent in Australia, "religious recluse."
3. Chronic psychosis, unclassified, in State hospital.
4. Dementia præcox, paranoid, in State hospital.

CHART XVIII. E. B. L. CASE NO. 6575.



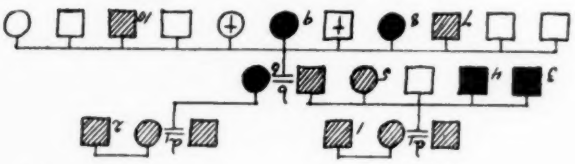
1. Deaf and dumb imbecile.
2. Sunstroke affected his mind, became childish and foolish.
3. Nervous temperament, fidgety.
4. Allied to manic-depressive insanity, in State hospital.

CHART XIX. E. F. CASE NO. 6529.



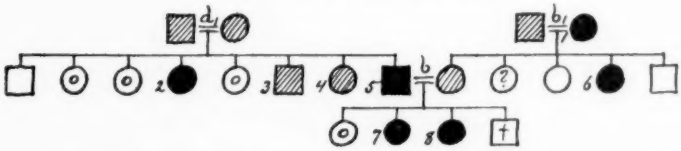
1. Senile deterioration shortly before death.
2. Son died of alcoholism.
3. When a girl went to Washington, lost her money, could not tell why she went there, was placed in an institution. Says a man has "witched" her. Has in her pocket a bottle of gin which she takes "for blood poison."
4. One son nervous, excitable, dull; one daughter mentally defective.
5. One son died of alcoholism.
6. Senile deterioration shortly before death.
7. Daughter had convulsions during teething.
8. Dementia præcox, paranoid, in State hospital.

CHART XX. A. M. B. CASE NO. 6723.



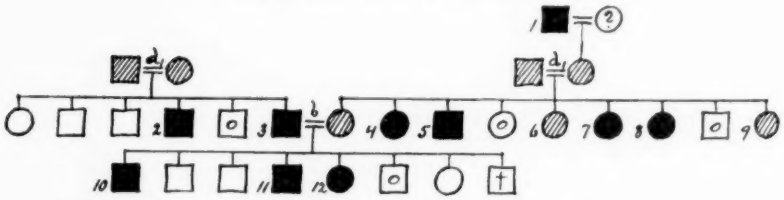
1. Insane children.
2. Insane daughter.
3. Nervous, queer.
4. Hot-tempered, queer, "nearly went insane over money losses."
5. Insane daughter.
6. Senile deterioration.
7. Child had convulsions.
8. Paranoic condition, in State hospital.
9. Paranoic condition, in State hospital.
10. Nervous daughter.

CHART XXI. M. F. CASE NO. 6917.



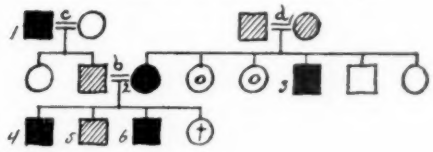
1. High strung, excitable.
2. "Awful temper."
3. Son died insane.
4. Daughter subject to attacks of depression.
5. Nervous breakdown early in life, unable to work, recovered.
6. Dictatorial, abnormally selfish.
7. Very queer, lives alone, boards cats for living.
8. Allied to manic-depressive insanity, in State hospital.

CHART XXII. B. A. CASE NO. 7263.



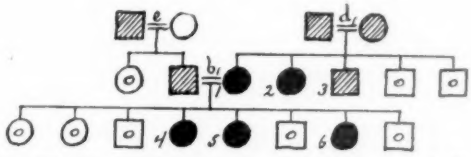
1. Very alcoholic.
2. Had nervous breakdown at the age of 53 years, died in a year.
3. Excitable temperament, abnormally suspicious, years ago periodically alcoholic.
4. Epileptic.
5. Moderately alcoholic, ideas of persecution against relatives.
6. Has feeble-minded son.
7. Loquacious, rambling, odd; had severe attack of depression following childbirth.
8. Subject to spells of severe depression.
9. Son is periodic drinker.
10. Water on the brain in childhood; stole money and worried about it greatly.
11. Slightly nervous, fainting spells.
12. Allied to manic-depressive insanity, in State hospital.

CHART XXIII. E. B. CASE NO. 7101.



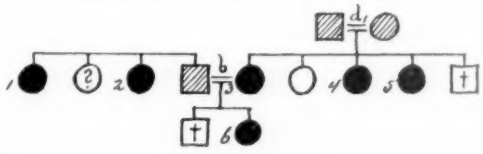
1. Senile deterioration.
2. Subject to "fits of paralysis," had one the day of the funeral (hysteria?).
3. Very alcoholic.
4. Was insane for sixteen years, died in State hospital.
5. Son had convulsions in childhood.
6. Allied to manic-depressive insanity, in State hospital.

CHART XXIV. J. M. CASE NO. 6426.



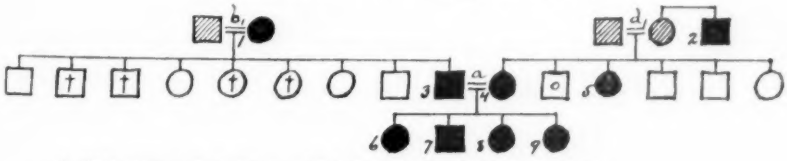
1. Was insane six months at menopause, depressed, "religious mania," recovered.
2. Had severe blue spells during menopause; daughter was treated for "nerves" at the age of 14 years.
3. Daughter had "nervous trouble," was under physician's care, recovered.
4. Quick tempered.
5. Dementia præcox, catatonic, in State hospital.
6. Nervous, fidgety, was "near collapse" and had to be sent away for two weeks about one year ago.

CHART XXV. E. H. CASE NO. 7253.



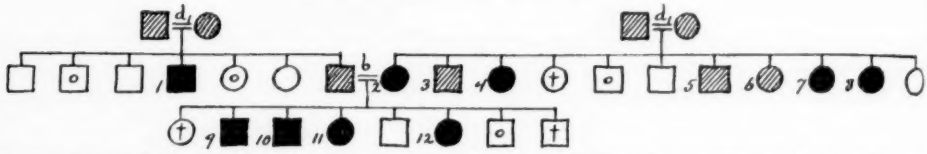
1. Nervous, fidgety.
2. Insane at menopause for one year, recovered, was in sanitarium.
3. Shallow woman, inferior intelligence, alcoholic, smokes.
4. Nervous, fidgety, treated by physician for "neurasthenia"; has eccentric, alcoholic son.
5. Shallow, frivolous woman, nervous, fidgety, easily excited.
6. Hysterical psychosis, in State hospital.

CHART XXVI. J. T. S. CASE NO. 7273.



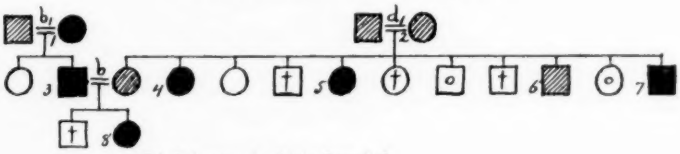
1. Ugly tempered at times, said to have been addicted to opium.
2. Insane before death; four out of seven children had manic-depressive insanity.
3. Senile dementia, ugly at times.
4. Odd, nervous temperament, easily excited.
5. Insane twice, very disturbed, recovered each time.
6. Nervous temperament, excitable.
7. Has been very nervous and melancholy for last two years.
8. Manic-depressive insanity, in State hospital.
9. Had nervous breakdown, hypochondriacal; son nervous.

CHART XXVII. S. S. CASE NO. 15177.



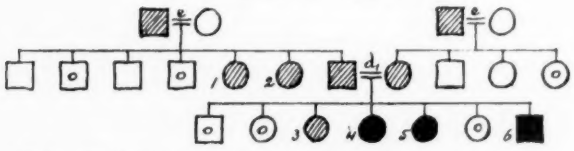
1. Cross and irritable; very alcoholic, took opium.
2. Irritable in early years of marriage, had "hysterical spells," ill-treated her step-children.
3. Several children were nervous, one son insane.
4. "Nervous" after sister's death; was too nervous to be interviewed or visited by anyone.
5. Had very nervous son.
6. One daughter had convulsions during teething, has hysterics when anything exciting occurs, is always nervous; another daughter is very nervous.
7. Senile deterioration for one year before death.
8. Senile deterioration last year and a half of her life.
9. Nervous, "especially when he had a cold or a headache."
10. Childish, has impediment in speech, has fits said to be epileptic.
11. Epileptic, in State hospital.
12. Very nervous, easily upset, poorly balanced.

CHART XXVIII. W. S. CASE NO. 6703.



1. Died insane in State hospital.
2. Cousin epileptic.
3. Nervous temperament, fidgety.
4. Melancholy disposition, had nervous prostration.
5. Nervous temperament, melancholy.
6. Daughter epileptic.
7. Insane few months before death.
8. Epilepsy, in State hospital.

CHART XXIX. M. J. CASE NO. 6295.



1. Daughter had melancholia for several years, recovered.
2. Daughter has nervous spells, mind rambles; has been in sanitarium for several years.
3. Daughter had manic-depressive insanity, was in State hospital, recovered.
4. Epilepsy, in State hospital.
5. Seems to have lost interest in life; when interviewed would say only "I know nothing more than sister told you."
6. Moderately alcoholic, never settled down to anything, but roamed around all his life until he died of pneumonia at the age of 62 years.

§ 6. Prevalence of the Neuropathic Taint in the General Population.

It would be very difficult, not to say impossible, to estimate accurately the proportion of neuropathic subjects in the total general population in any large community.

In the report for the year ending September 30, 1909, the New York State Commission in Lunacy gives the number of insane patients in State hospitals and private institutions as 31,540 or one to 276 in the general population; this figure does not include the inmates of institutions for the feeble-minded and for epileptics, it does not include the neuropathic subjects who find their way into prisons, reformatories, almshouses, disciplinary schools, hospitals for incurables, general hospitals, neurological clinics, etc., and, above all, it does not include the many neuropathic subjects whose infirmities are latent or of such nature as not to incapacitate them for ordinary occupations and life at large.

An attempt to estimate the proportion of all mental defectives (idiots and imbeciles as well as the insane) in the general population was made in the Canton of Bern, Switzerland, in 1902. In the enumeration were included patients who lived in their homes as well as in asylums. The proportion was 1 to 117 in the general population.[16]

It is clear that the proportion thus estimated must fall far short of the figure that would represent the actual incidence of the neuropathic constitution, for in such an enumeration no account is taken of conditions like hysteria, abnormal disposition, and the like,—conditions which could be included neither with cases of feeble-mindedness nor with those of frank insanity.

So far as our own material is concerned we have already had occasion to state that of all subjects recorded as neuropathic, not counting those who died in childhood, only 26.3 per cent presented at any times in their lives indications for commitment to sanitariums or public institutions. If this percentage be regarded as fairly representative in general, then the total incidence of neuropathic manifestations would be roughly estimated as affecting between 1.5 and 2.0 per cent of the general population.

In order to form an idea of the real prevalence of the neuropathic taint in the general population it is necessary to know not only the proportion of individuals actually neuropathic, but also that of those who are themselves normal but carry the taint from their ancestors, as represented by the symbol DR. In our material, out of 172 matings which resulted in neuropathic offspring

[16] *Ergebnisse der Zählung der Geisteskanken im Kanton Bren, 1. Mai, 1902.* Mitteilungen der Bernischer statistischen Bureaus, 1903.

only in 17 were both mates neuropathic, in 93 one mate was neuropathic and the other normal, and in 62 both mates were normal.

Our material affords a means of estimating the probable proportion of individuals, in the communities in which our study was made, who carry the neuropathic taint.

It will be borne in mind that an individual who is normal but who carries the neuropathic taint and is capable of transmitting it, can have neuropathic offspring only when his mate is either neuropathic or normal but, like himself, carries the taint; for if his mate is normal and of pure normal ancestry no neuropathic offspring will result, as has already been shown, and as is illustrated by the following formula:

$$DR \times DD \propto DD + DR.$$

A group of subjects who are capable under the above-mentioned conditions of producing neuropathic offspring, who marry freely into the general population, selecting mates more or less at random, will show, by the relative frequency with which they produce neuropathic offspring, how common in the general population are persons who carry the neuropathic taint.

Among the subjects who figure in our charts and statistics there are 466 who are theoretically classed as simplex, represented by the symbol DR, namely, all the normal subjects who have resulted from matings of the second and third types, two-thirds of the normal subjects who have resulted from matings of the fourth type, and one-half of those who have resulted from matings of the fifth type. From this number must be deducted 179 who have not married or have married but have had no children. From the remainder must be deducted further 66 subjects who are among the direct ascendants of our patients, all of whom have, of course, had neuropathic offspring, and who should obviously not figure in such statistics. Of the remaining 221 subjects, all of whom, if mated with neuropathic or simplex subjects, were capable of producing neuropathic offspring, 70 actually had such offspring and 151 had normal offspring.

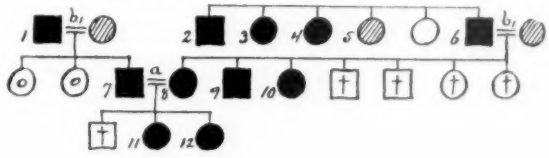
In other words, our data seem to show that no less than 31.6 per cent of the general population carry the neuropathic taint!

It is interesting to note here that the districts in which our investigations have been carried out are, according to the statistics

of the State Commission in Lunacy, among those showing comparatively low or moderate incidence of insanity.[17]

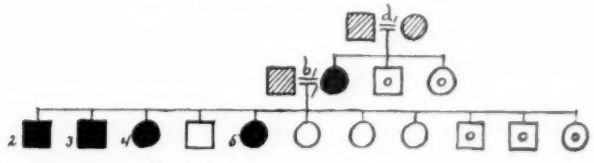
Our material is presented in detail in the shape of pedigree charts, some of which have already appeared in connection with § 4 and § 5; the rest are appended here.

CHART XXX. R. G. CASE NO. 6873.



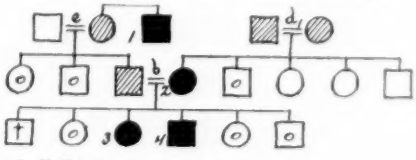
1. Alcoholic.
2. Feeble-minded.
3. Feeble-minded.
4. Hypochrondriacal, had nervous prostration.
5. Daughter insane, died in State hospital.
6. "Visionary, had no idea of the value of money, always trying big schemes, became a complete wreck from drink."
7. Eccentric.
8. Allied to manic-depressive insanity, in State hospital.
9. "Visionary, unsound, goes wild in arguments, imagines he owns everything."
10. "Crazy," fits of temper, gets wild; violent headaches.
11. Dementia præcox, paranoid, in State hospital.
12. Microcephalic, defective, died in infancy.

CHART XXXI. F. N. CASE NO. 7452.



1. Nervous temperament, easily excited.
2. Nervous temperament, easily excited.
3. Excessively alcoholic early in life, had cirrhosis of the liver.
4. Has spells of rigidity and twitching "only when she can't have her way"; always queer, never lived with husband, finally divorced; "worse than the patient herself (sister) sometimes."
5. Dementia præcox, paranoid, in State hospital.

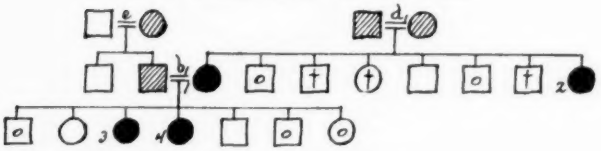
CHART XXXII. L. P. CASE NO. 6234.



1. Epilepsy.
2. "Great talker"; inferior make-up.
3. Very nervous following birth of son, recovered.
4. Dementia præcox, paranoid, in State hospital.

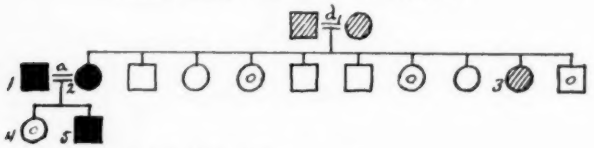
[17] Report of the New York State Commission in Lunacy for the year ending September 30, 1909.

CHART XXXIII. M. D. CASE NO. 6046.



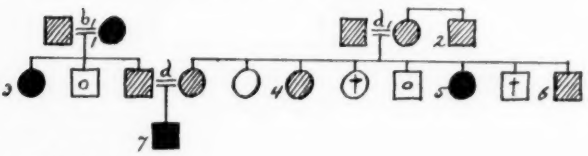
1. Attacks of depression, was in State hospital, recovered.
2. Convulsions in childhood.
3. Insane for four months following birth of child, was in State hospital, recovered.
4. Manic-depressive insanity, in State hospital, recovered.

CHART XXXIV. A. P. CASE NO. 7278.



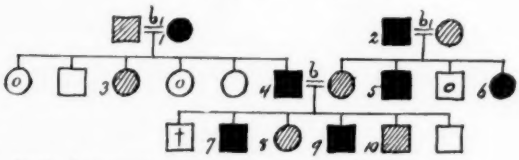
1. Attack of depression, recovered.
2. Hysteria.
3. Son feeble-minded.
4. 18 years old.
5. Dementia præcox, paranoid, in State hospital.

CHART XXXV. F. L. CASE NO. 7295.



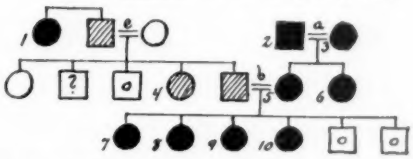
1. Senile psychosis.
2. Daughter insane.
3. Insane, was in State hospital, discharged as recovered but is still very eccentric.
4. Son had convulsions in childhood, later in life committed suicide.
5. Alcoholic.
6. Son epileptic.
7. Dementia præcox, paranoid, in State hospital.

CHART XXXVI. F. T. CASE NO. 7218.



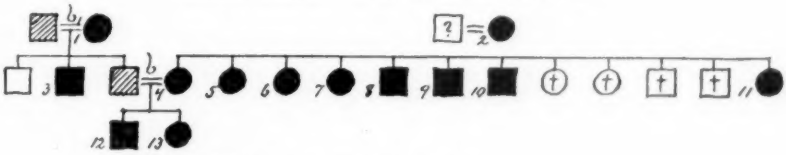
1. Senile deterioration.
2. Very alcoholic, disappeared from home, suspected suicide.
3. Daughter nervous, restless, has phobias.
4. Melancholia for several months; make-up restless and worrisome.
5. Restless, fidgety, "lack of repose," moderately alcoholic.
6. Chronic delusional psychosis; died in State hospital.
7. Restless.
8. Child died in convulsions; another has violent fits of temper.
9. Dementia præcox, paranoid, in State hospital.
10. Child had convulsions while teething.

CHART XXXVII. C. S. CASE NO. 7068.



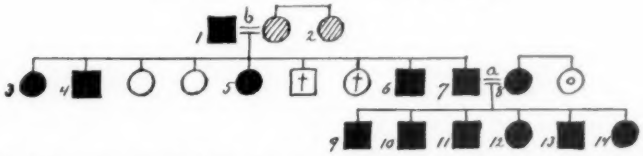
1. Nervous, flighty, "talks about things she knows nothing of."
2. Alcoholic, had delirium tremens.
3. Sick headaches.
4. Has epileptic children.
5. Sick headaches, unilateral.
6. Sick headaches.
7. Epileptic, in State hospital.
8. Convulsions in childhood, sick headaches.
9. Died in convulsions.
10. Nervous, fidgety.

CHART XXXVIII. A. L. McM. CASE NO. 7302.



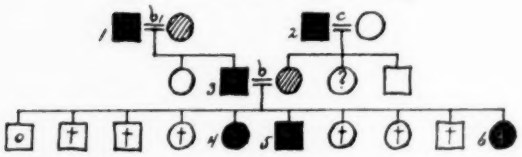
1. Died insane at an advanced age.
2. Eccentric.
3. Died insane; son also died insane in an asylum.
4. Eccentric, "very queer."
5. Eccentric, "very queer."
6. Eccentric, "very queer."
7. Eccentric, "very queer."
8. Eccentric, alcoholic.
9. Eccentric, alcoholic.
10. Eccentric, alcoholic.
11. Eccentric, "very queer."
12. "Peculiar."
13. Manic-depressive insanity, in State hospital.

CHART XXXIX. I. W. CASE NO. 7008.



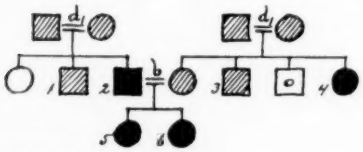
1. Violent temper, very alcoholic; became violently insane, had to be tied down; died insane.
2. Daughter was somewhat feeble-minded.
3. Chronically insane, in State hospital; daughter had screaming spells when a baby, is of nervous temperament.
4. Not considered bright.
5. Not very bright.
6. Always feeble-minded.
7. Violent temper, "always fighting, almost an animal now."
8. Extremely alcoholic.
9. Quick-tempered, severe headaches.
10. Very alcoholic, not very bright.
11. Quick-tempered, not very bright; son died in convulsions in infancy.
12. Paranoic condition, in State hospital.
13. Chronically insane, in State hospital; son had convulsions.
14. Bad temper, eccentric.

CHART XL. J. H. CASE NO. 6283.



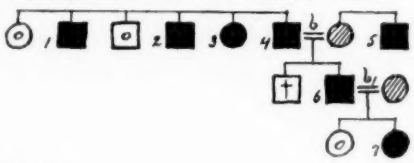
1. Very alcoholic.
2. Alcoholic.
3. Very irritable, nervous, disagreeable; children afraid of him.
4. Nervous temperament, severe blue spells.
5. Dementia præcox, in State hospital.
6. High strung, cries very easily.

CHART XLI. M. L. CASE NO. 6120.



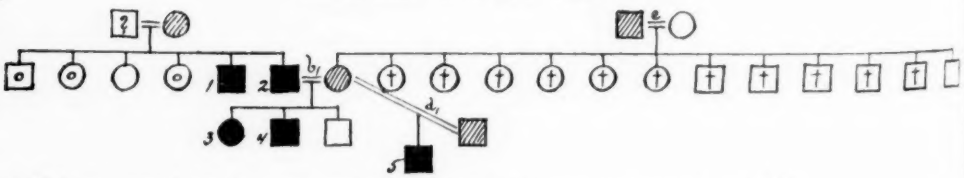
1. Son is of "nervous make-up."
2. Following business reverses he worried, doctor said he was insane and sent him to a sanitarium.
3. Son deformed, nervous, "very odd."
4. Extremely nervous, "nervously exhausted"; has son who is also extremely nervous, eccentric, has severe headaches.
5. Always nervous.
6. Manic-depressive insanity, in State hospital.

CHART XLII. M. W. P. CASE NO. 6637.



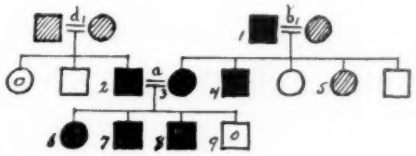
1. Very alcoholic.
2. Very alcoholic.
3. Melancholy through trouble, was in State hospital 18 months.
4. Alcoholic, left home, son saw him only three times.
5. Very alcoholic, daughter had epilepsy.
6. Periodic drinker.
7. Dementia præcox, in State hospital.

CHART XLIII. J. C. McM. CASE NO. 3664.



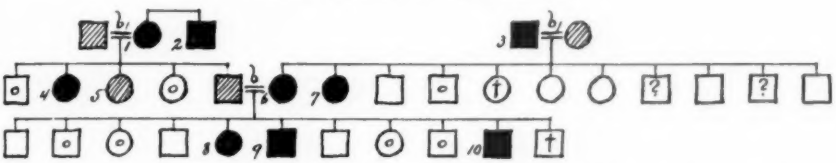
1. Had some mental trouble, was in sanitarium for several months about seven years ago, recovered.
2. Eccentric, cross, cranky, irritable, very alcoholic, wife was afraid of him.
3. Nervous temperament, excitable.
4. Epilepsy, in State hospital.
5. Melancholy, was in State hospital for four months.

CHART XLIV. E. L. CASE NO. 7325.



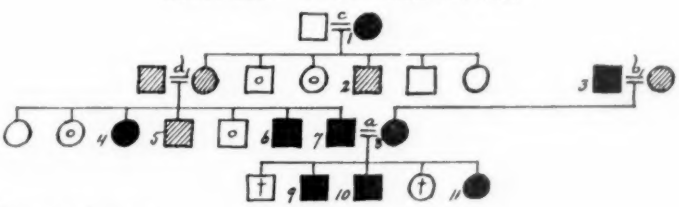
1. Violent, quick temper.
2. Periodic drinker.
3. Spells of "nervous weakness" after son became insane, was under physician's care.
4. Periodic drinker.
5. Daughter "odd," very quiet disposition.
6. Died in infancy of convulsions ("inward spasms").
7. Died in infancy of convulsions ("inward spasms").
8. Dementia præcox, paranoid, in State hospital.
9. 20 years old, apparently normal.

CHART XLV. B. B. CASE NO. 1278.



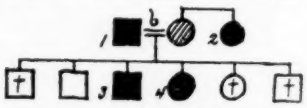
1. Violent temper, screamed when she got angry, flighty, "if anything ails her it goes to her head."
2. Insane.
3. Alcoholic.
4. Epilepsy; daughter nervous.
5. One daughter had nervous prostration following childbirth and died; another daughter is nervous.
6. Nervous, eccentric.
7. Is nervous, has fainting spells, suffers from neuralgia, had nervous prostration at menopause; one child died in convulsions.
8. Nervous.
9. Dementia præcox, in State hospital.
10. Died in convulsions in childhood.

CHART XLVI. C. R. S. CASE NO. 17242.



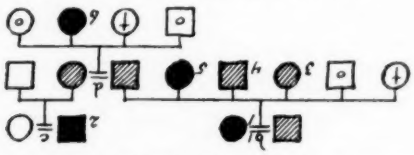
1. Nervous and queer.
2. Two sons were insane; one had melancholy spells, was in an asylum, committed suicide; another is still in an asylum.
3. Very irritable and eccentric, had spells when he was violent and ill-treated his wife, was by some considered insane.
4. "Nervous."
5. Has feeble-minded, nervous son.
6. Was insane, committed suicide.
7. Nervous, irritable, very eccentric, religious crank.
8. Spells of eccentricity, "out of her mind at times."
9. Epileptic, alcoholic, criminal, in State hospital.
10. Dementia præcox, paranoid, in State hospital.
11. Died in convulsions in infancy.

CHART XLVII. C. R. S.'S STEP-BROTHERS AND STEP-SISTERS. CASE NO. 17242.



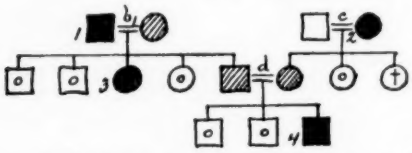
1. Nervous, irritable, very eccentric, religious crank; C. R. S.'s father.
2. Has fainting spells, fits of craziness at monthly periods, tears her hair, etc.
3. Irresponsible criminal, committed theft several times, not well-balanced, degenerate, moderate drinker.
4. Nervous, has fainting spells, "nervous prostration."

CHART XLVIII. O. D. CASE NO. 5894.



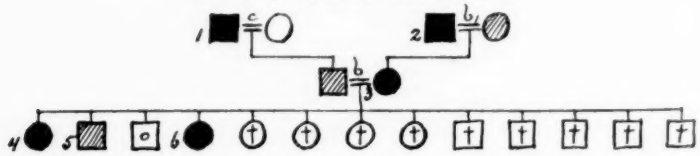
1. Nervous, "not right," ideas of jealousy, "subject to fits of unreasonable anger, turned guests out of the house."
2. Eccentric, irritable.
3. Has very nervous daughter.
4. Has nervous son.
5. Very eccentric in dress and manners; one daughter has fainting spells; another is "out of her mind by spells."
6. Dementia præcox, paranoid, in State hospital.

CHART XLIX. H. N. CASE NO. 3962.



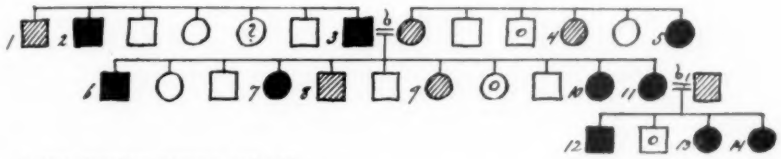
1. Was insane for eight years before he died.
2. Nervous.
3. Nervous, insomnia, neuralgia.
4. Dementia præcox, in State hospital.

CHART L. M. E. S. CASE NO. 4455.



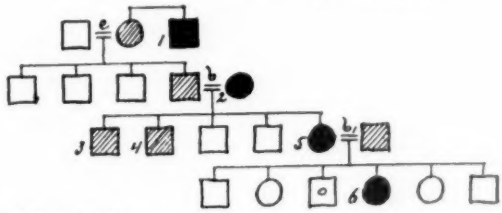
1. Insane.
2. Queer, intemperate.
3. Chronic psychosis "caused by worry" at the age of 62 years; in State hospital
4. Died at the age of 23 years, was "nervous invalid" for two years before death.
5. One son queer.
6. Nervous, excitable, queer.

CHART LI. L. W. CASE NO. 14840.



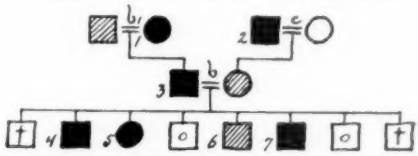
1. One daughter nervous and odd.
2. Violently insane for six months before death; three children had convulsions.
3. Suffered several years from "nervous trouble," was too ill to work; became insane just before death; to escape law suit committed suicide.
4. Two daughters very nervous.
5. Nervous and odd; three children had water on the brain, one died in convulsions.
6. Nervous, suffered from nightmares.
7. Was insane for six months, in State hospital, recovered; one child is nervous, three had convulsions in childhood.
8. Son had convulsions in childhood.
9. Four children, all nervous, two had convulsions in childhood.
10. Nervous, eccentric, spells of depression with crying.
11. Chronically insane, in State hospital.
12. Nervous, convulsions in infancy.
13. Queer, dull and stupid, mind affected, "not right."
14. Very nervous, especially at time of pregnancy, "her mind is affected at times."

CHART LII. A. E. S. CASE NO. 2998.



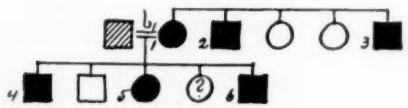
1. Eccentric, religious fanatic.
2. Very excitable and nervous, violent temper, threw things at people when angry.
3. Daughter has nervous spells, probably petit mal.
4. Daughter had convulsions in childhood.
5. Dementia præcox, paranoid, in State hospital.
6. Fainting spells, "lump in throat; knew what was going on but could not speak while spell lasted";—probably hysteria.

CHART LIII. E. C. P. CASE NO. 6322.



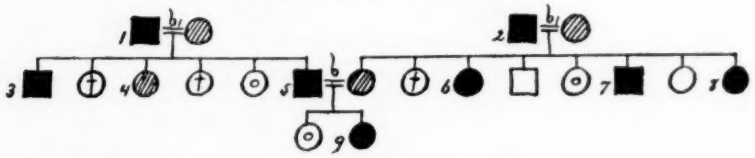
1. Senile dementia.
2. Senile dementia, weak spells.
3. Insane, in State hospital for a short time.
4. Restless, fidgety.
5. Dementia præcox, in State hospital.
6. Two daughters suffered from sick headaches.
7. Nervous, restless, worrisome.

CHART LIV. M. M. CASE NO. 6290.



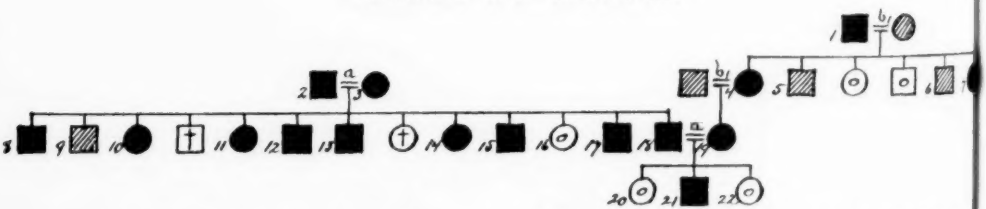
1. "High-tempered."
2. "High-tempered," alcoholic.
3. "Bad temper," moderately alcoholic.
4. Very alcoholic.
5. Dementia præcox, catatonic, in State hospital.
6. Very alcoholic.

CHART LV. F. B. CASE NO. 6874.



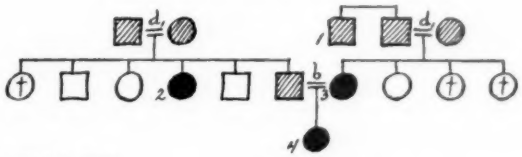
1. "Worrier."
2. Nervous temperament, fidgety, depressed spells, was in sanitarium.
3. Nervous breakdown, "hysterical" a few years ago, recovered.
4. Child has nervous temperament, doctor says "should be kept outdoors."
5. Nervous temperament, worries, at times pessimistic, considered queer though bright.
6. Nervous temperament, worries.
7. Insane, depressed, "religious mania," in State hospital four months, recovered.
8. Insane, in State hospital about six years, onset after birth of sixth child; imagines she is a detective and has immense treasures.
9. Dementia præcox, paranoid, in State hospital.

CHART LVI. G. G. CASE NO. 6880.



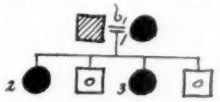
1. Easily excited, bad temper, very alcoholic.
2. Very bad temper, whipped his children brutally.
3. Eccentric, odd crank, lived all alone.
4. Nervous temperament, easily frightened, insane at menopause, committed suicide.
5. Two daughters have melancholy spells.
6. Son committed suicide.
7. Insane twice, "religious mania."
8. Convulsions during teething.
9. Suffered from asthma; died at age of 38 in an accident; son died in convulsions.
10. Died in convulsions in infancy.
11. Bad tantrums, bad temper; two children had convulsions, one was fidgety.
12. Bad temper; one son had convulsions in infancy, [illegible] other is fidgety.
13. Very stubborn.
14. Peculiar temper.
15. Very alcoholic, very bad temper.
16. 29 years old, "easy going," weighs 300 pounds.
17. Stuttered, nervous.
18. Very easily excited, quick-tempered, "nags repeatedly."
19. Nervous, gets confused easily; when pregnant imagined things; has melancholy spells.
20. 15 years old.
21. Dementia præcox, hebephrenic.
22. Eight years old.

CHART LVII. M. B. CASE NO. 4981.



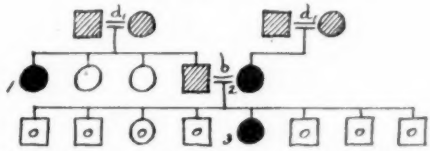
1. Had feeble-minded child.
2. Insane for one year following injury to spine, was in sanitarium, recovered without trace of organic trouble.
3. Nervous temperament.
4. Paranoic condition, in State hospital.

CHART LVIII. C. L. C. CASE NO. 6381.



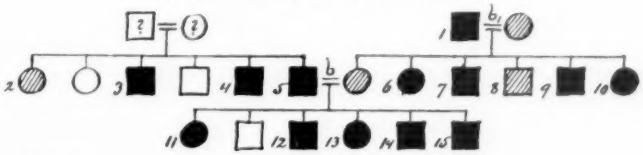
1. Eccentric, feeble-minded, epileptic.
2. Insane epileptic, in State hospital four years.
3. Insane epileptic, in State hospital.

CHART LIX. E. A. CASE NO. 6429.



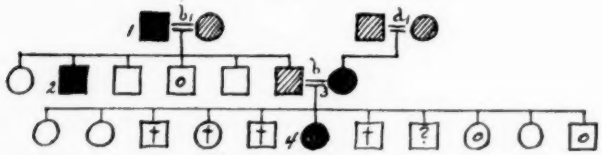
1. Feeble-minded.
2. Queer, never saw neighbors, stayed in the house, kept doors and windows locked.
3. Dementia præcox, in State hospital.

CHART LX. A. W. CASE NO. 6172.



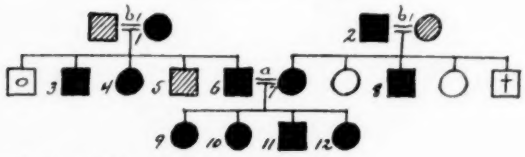
1. Very alcoholic, cranky, stubborn, convulsions.
2. Daughter nervous, "worries over nothing."
3. Highly nervous temperament, "crosses bridges before he comes to them."
4. Nervous temperament, moderately alcoholic.
5. Highly nervous temperament, irritable nature, worries over little things.
6. Fainting spells.
7. Shiftless, alcoholic, periodic sprees.
8. Children have epilepsy and fainting spells.
9. Religious crank, alcoholic.
10. Inferior make-up, possibly epileptic.
11. Worries over things; blue spells; "way up then way down."
12. Highly nervous temperament, "worries over things which never happen," alcoholic.
13. Dementia præcox, inferior make-up, in State hospital.
14. Very alcoholic.
15. Formerly very alcoholic; had a convulsion at the age of 21 years.

CHART LXI. F. M. CASE NO. 7277.



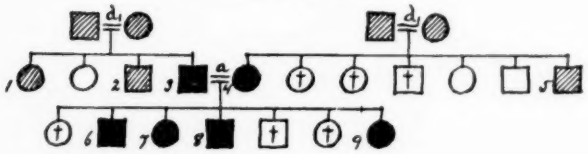
1. Periodic drinker, "a demon when drunk."
2. Rambler.
3. Delusional psychosis at menopause lasting nine years.
4. Recurrent delusional psychosis allied to manic-depressive insanity, in State hospital.

CHART LXII. M. C. CASE NO. 6868.



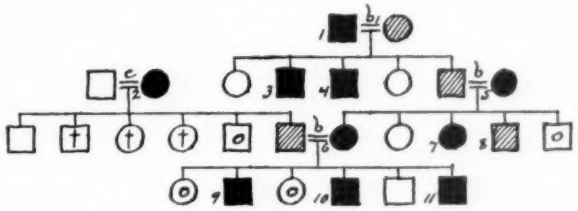
1. High-tempered, excitable, impulsive.
2. High-strung, excitable, alcoholic.
3. Alcoholic, daughter high-strung.
4. Extremely nervous, eccentric.
5. Daughter has nervous temperament, fidgety, easily excited.
6. High-strung, periodically alcoholic.
7. Had nervous prostration eleven years ago, lasted two years, never fully recovered.
8. Alcoholic, wanderer.
9. High-strung, nervous temperament.
10. Very excitable, high-strung.
11. Constitutional inferiority, in State hospital.
12. Fidgety, cannot keep still.

CHART LXIII. E. McG. CASE NO. 7180.



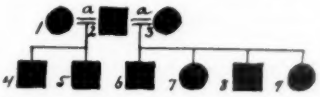
1. Had very alcoholic son who was found dead.
2. Son had neuralgia.
3. Fainting spells.
4. Fainting spells.
5. Child died in convulsions.
6. Died in convulsions in infancy.
7. Died in convulsions in infancy.
8. Dementia præcox, paranoid, in State hospital.
9. Fainting spells; child died in convulsions in infancy, other children normal.

CHART LXIV. S. W. CASE NO. 6965.



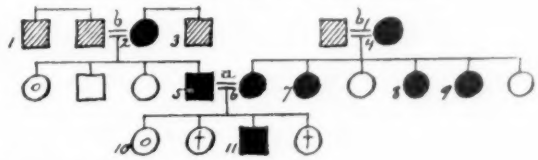
1. Epilepsy.
2. Insane for a time, recovered.
3. Epileptic imbecile.
4. Imbecile.
5. Melancholia in early married life, recovered.
6. Insane five years, was in State hospital, recovered.
7. Insomnia, neuralgia.
8. Daughter had spells of excitement.
9. Feeble-minded.
10. Dementia præcox, catatonic, in State hospital.
11. Died of marasmus, had one convulsion.

CHART LXV. E. K. CASE NO. 6529.



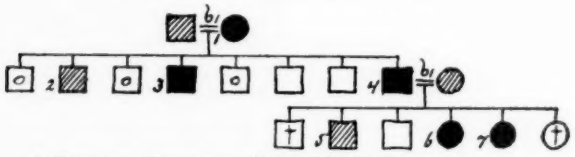
1. "Ignorant, queer."
2. Insane, was in sanitarium, committed suicide.
3. Eccentric, violent temper, ideas of persecution against neighbors and relatives.
4. Eccentric, not well-balanced.
5. Alcoholic, lazy, indolent.
6. Dementia præcox, paranoid, in State hospital.
7. Violent temper, queer, extreme dolichocephaly.
8. Defective, cranial malformation.
9. Inferior, "slow."

CHART LXVI. C. VAN C. CASE NO. 6470.



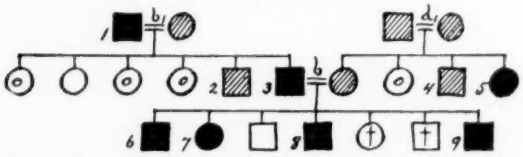
1. Some children queer.
2. Eccentric, very suspicious.
3. One daughter insane, another eccentric.
4. Nervous, irritable, quick-tempered; suffers from neuralgia.
5. Very eccentric, suspected wife of trying to poison him, later suspected others as well.
6. Insomnia for two years during menopause, extremely nervous.
7. Nervous, quick-tempered; has insane son.
8. Very irritable, nervous, quick-tempered.
9. Very irritable, nervous, quick-tempered.
10. 17 years old.
11. Constitutional inferiority, in State hospital.

CHART LXVII. A. H. CASE NO. 6605.



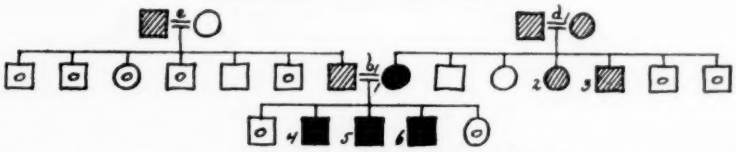
1. Eccentric, "very queer," morphine fiend.
2. Son drank heavily, was dissipated, "black sheep."
3. Very alcoholic, mind failed toward the last.
4. Religious crank, very eccentric.
5. One son and one daughter had convulsions in childhood.
6. Dementia præcox, paranoid, in State hospital.
7. Nervous temperament, high-strung.

CHART LXVIII. J. McK. CASE NO. 7121.



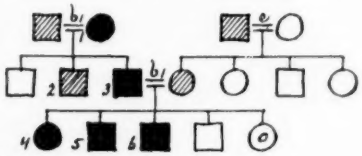
1. Insane for four or five years following money losses, died in hospital.
2. Two daughters insane.
3. Eccentric crank, high-strung.
4. One daughter insane.
5. Nervous temperament, fidgety.
6. Nervous temperament, easily excited; one daughter is nervous, imagines things; son nervous, easily irritated, periodic drinker.
7. Nervous, easily excited, easily frightened, periodically alcoholic.
8. Psychasthenia with impulses and fears, in State hospital.
9. Nervous, has choking spells, easily excited.

CHART LXIX. T. H. CASE NO. 6931.



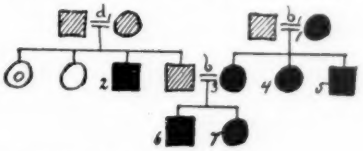
1. Nervous, emotional, "very distant"; had an attack of melancholia, sat in corner, would not eat, smelled peculiar odors, now well.
2. Child had convulsions "from teething" and died.
3. Child died in convulsions in infancy.
4. Periodic alcoholic; daughter had convulsions in infancy.
5. Dementia præcox, paranoid, in State hospital.
6. Convulsions in infancy; son nervous and had one convulsion in infancy.

CHART LXX. J. L. CASE NO. 7254.



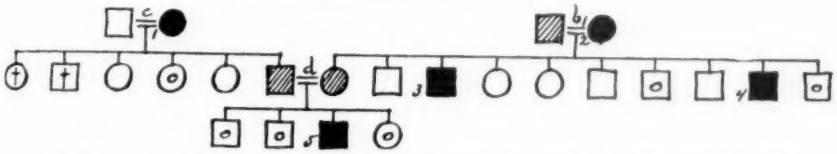
1. Senile dementia.
2. Daughter had migraine.
3. Feeble-minded.
4. Two attacks of nervous breakdown, was melancholy, recovered.
5. Alcoholic.
6. Dementia præcox, paranoid, in State hospital.

CHART LXXI. W. G. CASE NO. 6263.



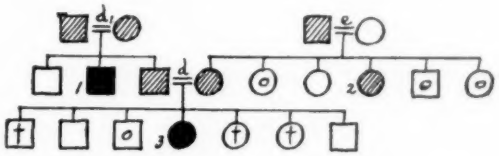
1. Eccentric, probably insane.
2. Very alcoholic.
3. Eccentric, miserly, seclusive, lived in filth, probably insane.
4. Insane, in State hospital.
5. Eccentric, very alcoholic.
6. Dementia præcox, paranoid, in State hospital.
7. Miserly, "like her mother," had spells of yelling, insane.

CHART LXXII. P. S. E. CASE NO. 6794.



1. Had spells of depression at 25 and 41 years respectively, would not talk, recovered each time.
2. Depressed, hypochondriacal.
3. Always worried about his health, imagined he had heart trouble.
4. Alcoholic, "has had every disease."
5. Imbecility with maniacal attacks, in State hospital.

CHART LXXIII. A. J. G. CASE NO. 6611.



1. Insane twice, in State hospital, recovered each time.
2. Daughter had convulsions in childhood; later had "nervous collapse" due to overwork at school, was in sanitarium two weeks.
3. Dementia præcox, in State hospital.

§ 7. Conclusions.

1. The neuropathic constitution is transmitted from generation to generation in the manner of a trait which is, in the Mendelian sense, recessive to the normal condition. Rules of theoretical expectation are accordingly as follows:

a. Both parents being neuropathic, all children will be neuropathic.

b. One parent being normal, but with the neuropathic taint from one grandparent, and the other parent being neuropathic,

half the children will be neuropathic and half will be normal but capable of transmitting the neuropathic make-up to their progeny.

c. One parent being normal and of pure normal ancestry and the other parent being neuropathic, all the children will be normal but capable of transmitting the neuropathic make-up to their progeny.

d. Both parents being normal, but each with the neuropathic taint from one grandparent, one-fourth of the children will be normal and not capable of transmitting the neuropathic make-up to their progeny, one-half will be normal but capable of transmitting the neuropathic make-up, and the remaining one-fourth will be neuropathic.

e. Both parents being normal, one of pure normal ancestry and the other with the neuropathic taint from one grandparent, all the children will be normal, half of them will be capable, and half not capable of transmitting the neuropathic make-up to their progeny.

f. Both parents being normal and of pure normal ancestry, all the children will be normal and not capable of transmitting the neuropathic make-up to their progeny.

2. Various clinical neuropathic manifestations bear to one another the relationship of traits of various degrees of recessiveness; in a most marked way recoverable psychoses, though recessive as compared with the normal condition, are dominant over epilepsy and allied disorders.

3. Various other clinical neuropathic manifestations bear to one another the relationship of neuropathic equivalents; that is to say, they are conditions of the same degree of recessiveness varying in their clinical manifestations with the personality of the subject, environmental conditions, etc.

4. All the neuropathic children which result from a mating of the fourth type (both parents normal, but each with the neuropathic taint from one grandparent) can have theoretically only equivalent defects and not defects of different degrees of recessiveness.

5. Among the actual results from such matings the following have been met with:

a. Brothers and sisters suffering from clinically identical neuropathic manifestations.

b. Psychosis in one subject and peculiar or abnormal disposition, but no actual psychosis, in brothers or sisters.

c. Psychosis in one subject and isolated but clinically related symptoms in brothers or sisters; we find with particular frequency dementia præcox = fainting spells or convulsions in childhood.

d. Psychoses clinically not known to be related: senile deterioration = peculiar hysteriform psychoses.

6. Neuropathic conditions show only in about one-fourth of the cases indications for commitment to sanitariums or public institutions. The total incidence or neuropathic conditions may be roughly estimated as affecting between 1.5 and 2 per cent of the general population.

7. It is further estimated that about 30 per cent of the general population, without being actually neuropathic, carry the neuropathic taint from their ancestors and are capable under certain conditions of transmitting the neuropathic make-up to their progeny.

ACKNOWLEDGMENTS.

Many persons have assisted us in various ways in collecting data for our study. We are indebted above all to our informants who have confided to us most intimate family secrets for a purely altruistic purpose.

We owe a large debt of gratitude to Dr. William Austin Macy, the superintendent of this hospital, whose unfailing sympathy with the spirit of scientific research has made possible the present study.

And we are also indebted to Dr. Charles B. Davenport, of the Carnegie Institution of Washington, for some suggestions, a good deal of general advice, and actual assistance.

A MANIC-DEPRESSIVE FAMILY.—A STUDY IN HEREDITY.*

By C. G. McGAFFIN, M. D., Taunton, Mass.

The problem of heredity has always been an interesting study from a psychiatric point of view; but within the last few years, it has been found to be one of the vital points of etiology in insanity. Much has been written concerning it, but there is as much and more to take up the pages of our journals.

It has been pretty definitely proven that feeble-mindedness is the result of a similar condition among the ancestors, and Huntingdon's chorea is known to be such a disease. On the other hand, we have yet to know what real part heredity plays in the causation of our insanities.

Manic-depressive insanity is known to show a large percentage of heredity, Kraeplin placing it as high as from 70 to 80 per cent; but the diseased conditions in the ancestors or in a single generation, usually do not take the form of manic-depressive symptoms, among the greatest number.

The family that is the basis of this paper, has been called a manic-depressive family since most of the insane members of it have shown symptoms of that psychosis.

It is a negroid group, being composed of Caucasian, Indian and Negro blood, the true proportions of which cannot be determined accurately through inadequate history. Such mixture of blood does not show up well on family histories and silence concerning certain members almost seems affirmatory.

Certain knowledge begins with the father and mother of this interesting group. It is definitely known that the mother was insane for a period during early adult life. She is described as being like one of her sons who was typically a manic-depressive. She had a brother who was similarly affected. The father of the group was normal as far as can be ascertained; but there must

* Read at the sixty-seventh annual meeting of the American Medico-Psychological Association, Denver, Col., June 19-22, 1911.

have been a taint in him somewhere to allow the mother to be so prepotent and bring forth the family that she did.

The result of the union of these two persons was twelve children. Nine of these lived to adult life and there is not a normal individual among them.

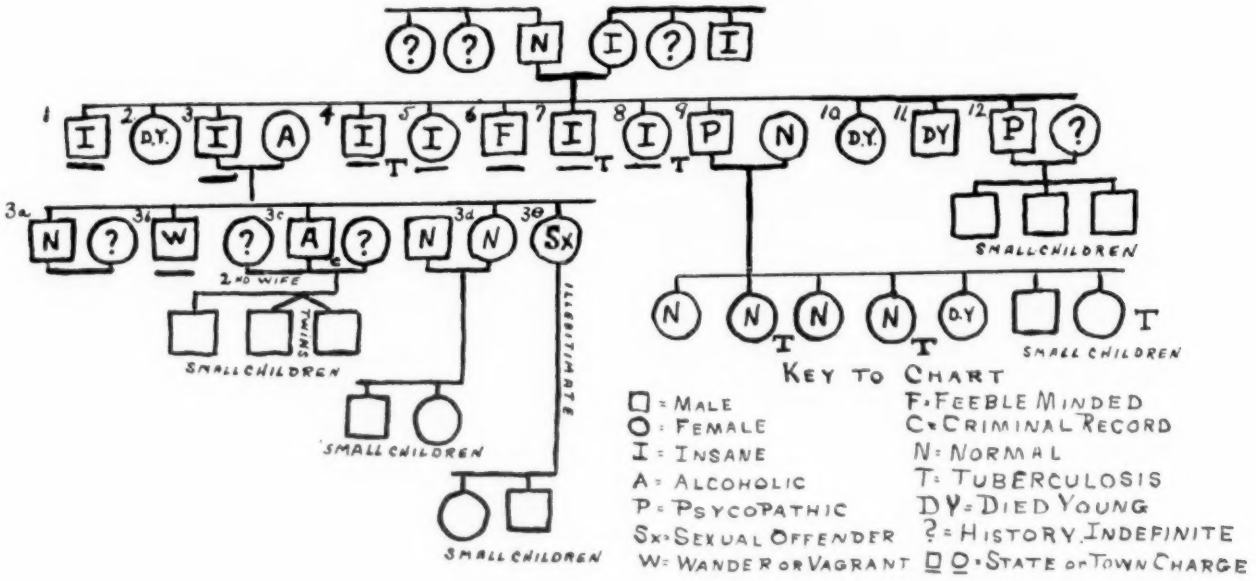
Beginning with the second generation, the writer has seen every member of three generations or has an accurate record of them. The descriptions of the individual members may be followed on the chart accompanying the paper.

1. George, born February 25, 1841, was admitted to Taunton State Hospital July 3, 1865, aged 24. On admission, was very talkative, restless and noisy, cleared up from his acute attack in a few months and was discharged, recovered. Diagnosis, acute mania. During the next six years, the patient was recommitted and discharged on three occasions. He then left Massachusetts and made New York State his home and while there, was a patient in the Utica State Hospital and the Manhattan State Hospital (Ward's Island). At which times his condition was similar to that at his earlier commitments. Fifth admission to Taunton, April 24, 1876. From that date until his death he remained continuously a patient. During the last 20 years of his life he had no excited periods and was in a normal condition. He was very industrious and was a valuable worker. He died February 9, 1911, of organic heart disease. George never married.

2. Harriet A., born November 10, 1843, died when 7 years old, cause of death unknown.

3. William, born November 12, 1844, is a veteran of the Civil War, serving in the Fifth Massachusetts Cavalry. First admission to insane hospital August 15, 1888, Danvers (Mass.) State Hospital, aged 43, discharged October 1, 1888, recovered. Diagnosis, acute mania. Admitted to Taunton State Hospital October 3, 1895. In all, there have been three commitments to Taunton and two discharges, recovered and much improved, and he is, at present, a patient at that hospital. During his active periods, he shows depression, retardation, and, with them, many almost katatonic traits; but during the lucid interval he shows no marked degree of dementia and he is thought, therefore, to be a case of manic-depressive insanity.

CHART OF THE C—— FAMILY.


? ? N I ? I
1 I 2 D.Y. 3 I A 4 I T 5 I 6 F 7 I T 8 I T 9 P N 10 D.Y. 11 DY 12 P ?
SMALL CHILDREN
3a N ? 3b W ? 3c A ? 3d N N 3e Sx
2ND WIFE
TWINS
SMALL CHILDREN
ILLEGITIMATE
SMALL CHILDREN
SMALL CHILDREN
N N T N N T D.Y. T
SMALL CHILDREN
KEY TO CHART
□ = MALE
O = FEMALE
I = INSANE
A = ALCOHOLIC
P = PSYCOPATHIC
Sx = SEXUAL OFFENDER
W = WANDER OR VAGRANT
F = FEEBLE MINDED
C = CRIMINAL RECORD
N = NORMAL
T = TUBERCULOSIS
DY = DIED YOUNG
? = HISTORY INDEFINITE
□ O = STATE OR TOWN CHARGE

On November 18, 1867, he married a full-blooded negro woman who was a marked alcoholic. The combination of insanity and alcohol made their married life a very stormy affair. They had five children.

3(a). William Jr., lived to adult life and married. No children. Dead, date of death unknown. As far as can be learned, this man was normal.

3(b). Charles, as a boy, would not go to school and would not engage in any occupation. Became a vagrant and died in the Taunton (Mass.) Almshouse November 1, 1905. The records of that institution give "heart trouble" as the cause of death.

3(c). Benjamin J., living in Brockton, Mass. He is an alcoholic, and is ugly and hard to approach. He has been arrested five times, once for "trespass" and four times for "assault," and has paid $65 in fines. He has been married twice and has four children. They are of school age and show no abnormalities.

3(d). Mary A., lives in West Medford, Mass., and is married to a normal appearing man and has two normal children. Mary seems normal in every way and fairly well educated.

3(e). Jenny, is in West Medford; is unmarried. At an early age she began to show sexual irregularities and was in a disorderly house and has had two illegitimate children. At present she is industrious, supporting herself and her children.

4. Charles, born September 26, 1846, single. This man had always been very talkative and was something of an inventor. First attack of mental trouble when 34 years old. Was excited, recovered in a few months.

Admitted to Taunton State Hospital, August 26, 1899. Auditory and visual hallucinations were marked, and many delusions were formed as a result of them. Had many religious ideas, thinking that he was Jesus Christ. Later became quiet and in his lucid periods, was an efficient worker in the laundry. Death September 5, 1901; cause pulmonary tuberculosis. Diagnosis, paranoia.

5. Sarah, born January 12, 1849, single. Was admitted to Taunton State Hospital July 17, 1888, aged 39. First attack was excited, noisy and restless. For the first three years of her residence, she was in a constant excitement; later showed lucid intervals and excited periods became shorter in duration. Patient

was transferred to Worcester State Asylum, November 20, 1893. Diagnosis, chronic mania. She is at present at Worcester and during her residence there has had regular periods of excitement with lucid intervals.

6. Marcus, born February 18, 1851. Was subject to frequent epileptic seizures up to the age of 25; since then, at very rare intervals. He was considered feeble-minded by the rest of the family and was placed in the Brockton (Mass.) Almshouse, where he remained several years and was later sent to the Massachusetts School for Feeble-Minded where he now is.

Record from that institution says that "he does not mix with the other patients, has ability to work without supervision. Talks a great deal about his family and about heaven. Will wear a piece of hair or a certain ring around finger and no amount of persuasion will induce him to give them away. Goes around picking up pieces of paper, pins, nails, etc., and putting them up his sleeve. Is neat and tidy in habits and appearance."

In this case of feeble-mindedness we have some manic-depressive symptoms such as the self-decoration, the collecting of miscellaneous worthless articles and the boasting concerning family.

7. Philip, born October 22, 1852, single. Was admitted to Taunton State Hospital August 5, 1884, aged 35. First attack was excited and had many delusions. Recovered slowly and a note in December, 1885, says: "Patient in good physical condition and better mentally than for a long period and is working in the laundry." Discharged May 11, 1886, recovered. Diagnosis, acute mania.

Philip, following his discharge, was able to support himself and was not again a State or town charge. He died in 1903 of pulmonary tuberculosis.

8. Harriet, 2d, born July 4, 1854, single. Was admitted to Taunton State Hospital July 10, 1886. Was noisy and excited. Discharged to Brockton Poor Farm, September 25, 1886. Recommitted to Taunton, October 30, 1888; noisy, incoherent and constantly talking. Made no improvement throughout hospital residence. Transferred to Worcester State Asylum November 20, 1893. Diagnosis, chronic mania. During her stay at Worcester it was noted that she had regular periods of excitement

when she was noisy and destructive. Died there April 25, 1899. Cause of death, pulmonary tuberculosis.

9. Hanford, born February 6, 1856. Has always been peculiar but has been able to live outside of an institution. He is industrious and something of an inventor, having made a stove damper that has found some sale. He overestimates their value however, and shows apprehension that they may be stolen and so hides them away about the house. In the naming of his children he shows his eccentricity by choosing names for them, the first letters of which are in alphabetical order starting with the oldest; Alice, Bertha, Cora, Della, Ethel, Forrest, Gladys. The next, he says, would be Henry or Harriet.

He married an apparently normal woman with Indian and Negro blood in her veins. She has evidently been prepotent as the six children of this union have been normal mentally, but some of them have succumbed to tuberculosis.

9(a). Alice, normal, is a bright, active, young woman earning her own living.

9(b). Bertha, dead, pulmonary tuberculosis.

9(c). Cora, normal young woman, bright and active, earning her own living.

9(d). Della, dead, pulmonary tuberculosis.

9(e). Ethel, died in infancy, cholera infantum.

9(f). Forrest, normal appearing boy of 12 years, attending school and says he enjoys it.

9(g). Gladys, 8 years old, has tuberculosis of hip and is considered delicate by the family.

10. Samuel B., born September 25, 1857, died in infancy.

11. Samuel B., 2d, born February 24, 1859, has always been peculiar. Thought himself a doctor with divine power and went about giving treatments and dispensing herbs and roots until he was arrested for practising medicine without a license. Got off with a small fine. He still thinks he has the power but fears the law and keeps out of its clutches. Will not work steadily and so does not provide well for his family. He has been married but his wife is dead. She is said to have been a normal woman. They had three boys, who are now of school age but have only one room for a home and are much neglected.

12. Mary, born March 9, 1862, died when a few years old, was considered a forward child.

No definite conclusions may be drawn from the study of one family, but the large number of insane members in one generation is interesting.

From the manic-depressive mother, there are five manic-depressive children, one feeble-minded, epileptic child who shows some manic-depressive symptoms; one, though while able to support his family, is exhilarated and boastful; one who considers himself too gifted to work, but whose genius does not support his family; and one paranoiac. This is, indeed, a wholesome outlook for later generations.

Fortunately, only one of the insane individuals, No. 3, married. The children of his alcoholic wife have shown no real psychoses, but there are mental defectives among them.

Nos. 9 and 12 have families but most of the children are too young to be sure of normality.

Nos. 1 and 4 to 8, inclusive, did not enter into alliances tending to promote defectives and the community has been spared the probable care of some, at least, of their progeny.

In the charting of such families, it is to be hoped that some comprehensive system will be adopted by the various institutions, so that with a definite similarity, all may be better understood.

It is the opinion of the writer that such charts give accurate data in tabloid form and add to the completeness of our case records.

ANALYSIS OF THE BLOOD IN FOURTEEN CASES OF PELLAGRA.

By JAMES C. BARDIN, M. D.,
Pathologist Central State Hospital, Petersburg, Va.

A consideration of the blood findings in any more or less chronic disease must take into account, first, the stage of the disease itself, and, second, any complicating disease which may be present, and which could reasonably modify the cell content of the blood. Therefore, before presenting these investigations into the blood picture of pellagra, the writer has been most careful to exclude other affections that could complicate the findings. Pellagra patients seem especially prone to contract tuberculosis—particularly intestinal tuberculosis—and they seem to be easy prey of intestinal parasites in some stages of the disease. The reason for this is obvious; the pellagra itself attacks the intestines and produces, usually, very severe lesions, which render them liable to be attacked by any organism that might happen to enter.

The present investigation, therefore, was made with two aims in view—to exclude wherever possible cases showing tuberculosis in any form, and to examine only such cases as were free from intestinal worms. The experience of the medical staff of this hospital attests the fact that cases of intestinal tuberculosis occurring in patients suffering with pellagra can not be detected, save in rare instances, until post mortem is done. The diarrhea, emaciation and the like of classical pellagra serve excellently to obscure any symptoms pointing to tuberculosis of the bowel; and the clinical pictures of pellagra patients who also have tuberculosis of the intestines, and of those without, are practically identical during the diarrheal periods of pellagra.

The writer is forced to reflect that the temperature variations in classical pellagra are not sufficiently definite. Were it ascertained that uncomplicated pellagra cases run no temperature, or else run a temperature that can readily be differentiated from that of tuberculosis, it is reasonable to infer that by keeping charts

of all patients in the diarrheal periods it would be possible to detect those complicated by tuberculosis of the bowel—which occurs frequently enough in pellagra cases in this hospital to make it a problem needing solution.

Such detection would be of value in aiding research into the blood findings in pellagra by enabling the investigator to rule out the tuberculous cases at the start. In a disease as grave as pellagra, it is of prime importance that a definite blood picture be established, if one exists; cases could then be more readily diagnosed in favorable stages.

The writer has so far performed post mortems on five pellagra cases which have been included in this series. Three of these showed tuberculosis of the bowel and a fourth showed healed lesions of the lungs. The fifth case showed no lesions of tuberculosis. One case, that did not die (No. 4), was pronounced tuberculosis of the lungs from the clinical findings and was sent to the tuberculosis colony; the case was recovering from the tuberculosis when pellagra developed. The patient went through a typical attack of pellagra and recovered. The tuberculosis did not reappear. Of the cases that came to post mortem, only one was diagnosed as tuberculosis of the bowel before death; this was a case of chronic pulmonary tuberculosis in the last stages, and the diarrhea was at first attributed to an intestinal tuberculosis; later on, pellagra symptoms appeared as complications. The other cases died with the tuberculous lesions unsuspected, and it was not until they came to post mortem that the lesions were discovered. The writer does not doubt that this is the case in many patients dying of pellagra who are not examined post mortem; tuberculosis probably complicates many of them, and the blood findings in such cases are necessarily erroneous.

In analysing the findings in a total of fourteen cases, considerable discrepancy was found to exist between the blood of those cases having tuberculosis and that of those not having it. The discrepancies occurred principally in the differential leucocyte counts. Before going on to consider the blood-picture, therefore, the writer will give the clinical and post mortem findings in the series, separating the tuberculous cases from the non-tuberculous, and describing the lesions briefly.

Cases Nos. 1, 2, 4, 7 and 13 were complicated by tuberculosis. All but No. 4 died and were examined post mortem. No. 4 has recovered from both tuberculosis and pellagra.

Case No. 1 had healed lesions in the lung and no intestinal lesions.

Case No. 2 had tuberculous ulcers in the lower part of the small bowel, but no lung involvement. The mesenteric glands were tuberculous.

Case No. 7 had chronic tuberculosis of both lungs and extensive tuberculous ulceration of the small bowel.

Case No. 13 had chronic and acute tuberculosis of the lungs, tuberculous ulceration of the small bowel, and acute miliary tuberculosis of the abdominal viscera.

Cases Nos. 3, 5, 6, 8, 9, 10, 11, 12 and 14 have shown no evidences of tuberculosis. Cases Nos. 5 and 8 died. No. 8 came to post mortem and showed no lesions of tuberculosis, but presented a typical picture of pellagra. Post mortem was not done on No. 5. The other cases were clinically free from tuberculosis, and most of them have shown no signs of that disease at any time since admission to the hospital. Many have apparently recovered from the pellagra, have gained weight and are in excellent physical condition.

The blood examinations in these cases were made as far as possible during the periods when the pellagra symptoms were at their height; that is to say, when there were marked diarrhea, skin lesions and stomatitis. In making the red and white counts, the usual technique was employed; dilute acetic acid was used in the white counts, and at least six different fields were counted and averaged in each examination. A variation of six leucocytes was allowed between the highest and lowest field counts. At least four white counts were made in each case—usually more—and the results averaged. Hayem's fluid was used for the reds, and four corner fields were counted on each slide, two slides being counted in each examination; a variation of ten was allowed between the lowest and highest field counts. In case the variations were too great in both red and white counts, the count was thrown out and another made.

In the differential counts, Wright's stain was employed. The edges and ends of the smears were not counted, and faulty

smears were thrown out. The technique was made, as far as possible, to conform to a uniform standard. Polymorphonuclears were counted as a group, excluding eosinophiles, which were counted separately. Lymphocytes were divided into small, large and transitional lymphocytes; any mononuclear, non-granular cell smaller than a polymorphonuclear was regarded as a small lymphocyte; any mononuclear, non-granular cell, with a circular or completely oval nucleus, larger than a polymorphonuclear was regarded as a large lymphocyte; any large mononuclear cell with an indented nucleus was regarded as a transitional. Mastzellen were not counted. At least 500 leucocytes were counted in each enumeration, and a minimum of four complete differential counts was made in each case. In cases presenting marked variations from the normal blood-picture, or in cases where the counts differed markedly among themselves, eight or ten counts were made. An average result in each case was found and used in the tables.

The appended tables were constructed as follows: The first two tables give the average results in the complete blood counts of the cases *in series*. Tables 3, 4, 5 and 6 are these same results separated into two divisions; tables 3 and 4 are the results in tuberculous cases, tables 5 and 6 are the results in non-tuberculous cases.

The various tables follow:

TABLE I.

Case No.	1*	2*	3	4	5*
Reds	5,728,000	3,716,000	3,892,000	5,086,000	4,338,000
Whites	7,960	8,000	7,600	6,800	6,760
Hemoglobin	75%	55%	55%	70%	70%

Case No.	6	7*	8*	9	10
Reds	4,388,000	2,252,000	3,056,000	4,264,000	3,434,000
Whites	14,400	7,800	8,100	7,000	6,700
Hemoglobin	65%	56%	60%	60%	70%

Case No.	11	12	13*	14	.....
Reds	3,890,000	3,540,000	3,560,000	3,436,000	.....
Whites	8,500	8,900	9,400	6,800	.....
Hemoglobin	65%	70%	50%	55%	.....

* Fatal cases.

TABLE II.

Case No.	1*	2*	3	4	5*	6	7*
Polymorphonuclears	61.2	76.5	61.2	42.3	69.7	64.9	61.0
Small Lymphocytes	19.0	14.5	23.1	39.9	22.2	27.7	22.2
Large Lymphocytes	11.8	7.5	11.8	14.3	7.7	5.8	13.8
Transitionals	3.5	1.2	2.8	2.2	0.0	0.0	3.0
Eosinophiles	0.1	0.5	0.1	0.2	0.6	1.5	0.0

Case No.	8*	9	10	11	12	13*	14
Polymorphonuclears	46.2	59.7	44.1	50.7	56.5	82.7	53.1
Small Lymphocytes	45.1	34.2	44.3	45.0	34.0	15.1	42.1
Large Lymphocytes	6.2	4.0	6.5	1.1	4.1	2.1	1.8
Transitionals	2.3	1.0	2.3	1.0	2.0	0.0	0.0
Eosinophiles	0.5	1.3	1.6	1.8	3.5	0.0	0.7

* Fatal cases.

It will be noted that table 1 reveals that there is usually a fairly well marked reduction in the number of red blood cells, a diminution in the percentage of hemoglobin and but little change in the leucocytes in all the cases.

The differential counts in table 2 reveal the fact that there is a variable reduction in the percentage of polymorphonuclears; a marked variability in the percentage of small lymphocytes, there being a reduction in some cases, increase in others; a fairly constant, but small increase in large lymphocytes; and a marked diminution in eosinophiles. The results secured in these tables were so divergent, and the discrepancies were so marked, that the writer was at a loss to know how to interpret them until it occurred to him to separate those cases having tuberculosis from those that were free from that disease. The results exceeded expectations.

The appended tables, 3 and 4, give the results in cases having tuberculosis, while 5 and 6 give the results in non-tuberculous cases:

TABLE III.

Cases showing tuberculosis clinically or at post mortem.

Case No	1*†	2*‡	4†	7*‡	13*‡
Reds	5,728,000	3,716,000	5,086,000	2,252,000	3,560,000
Whites	7,960	8,000	6,800	7,800	9,400
Hemoglobin	75 %	55 %	70 %	56 %	50 %

* Fatal cases. † Healed tuberculous processes. ‡ Active tuberculous processes.

TABLE IV.

Cases showing tuberculosis clinically or at post mortem.

Case No.	1 *†	2 *‡	4 †	7 *‡	13 *‡
Polymorphonuclears	61.2	76.5	42.3	61.0	82.7
Small Lymphocytes	19.0	14.5	39.9	22.2	15.1
Large Lymphocytes	11.8	7.5	14.3	13.8	2.1
Transitionals	3.5	1.2	2.2	3.0	0.0
Eosinophiles	0.1	0.5	0.2	0.0	0.0

* Fatal cases. † Healed tuberculous processes. ‡ Active tuberculous processes.

TABLE V.

Cases showing no clinical or post mortem evidences of tuberculosis.

Case No.	3	5 *	6	8 *	9
Reds	3,892,000	4,338,000	4,388,000	3,056,000	4,264,000
Whites	7,600	6,760	14,400	8,100	7,000
Hemoglobin	55 %	70 %	65 %	60 %	60 %

Case No.	10	11	12	14	.....
Reds	3,434,000	3,890,000	3,540,000	3,436,000	.....
Whites	6,700	8,500	8,900	6,800	.....
Hemoglobin	70 %	65 %	70 %	55 %	.....

* Fatal cases.

TABLE VI.

Cases showing no clinical or post mortem evidences of tuberculosis.

Case No.	3	5 *	6	8 *	9
Polymorphonuclears	61.2	69.7	64.9	46.2	59.7
Small Lymphocytes	23.1	22.2	27.7	45.1	34.2
Large Lymphocytes	11.8	7.7	5.8	6.2	4.0
Transitionals	2.8	0.0	0.0	2.3	1.0
Eosinophiles	0.1	0.6	1.5	0.5	1.3

Case No.	10	11	12	14	.....
Polymorphonuclears	44.1	50.7	56.5	53.1	.....
Small Lymphocytes	44.3	45.0	34.0	42.1	.....
Large Lymphocytes	6.5	1.1	4.1	1.8	.....
Transitionals	2.3	1.0	2.0	0.0	.....
Eosinophiles	1.6	1.8	3.5	0.7	.....

* Fatal cases.

A consideration of table 3 reveals the fact that two cases show high red counts and high hemoglobin percentages, while three have low figures. The high count in Case 1 may be explained by the fact that the patient had chronic pellagra and suffered with an unusually depleting diarrhea for a long time; the abstraction of the body fluids may have served to concentrate the blood enough to cause a high count. The high count in Case 4 may be ex-

plained by the fact that the examinations were made in the intermittent period of the pellagra; the patient had no diarrhea, and the physical condition generally was good, though the skin lesions were prominent. Cases 2, 7 and 13 showed low red counts and hemoglobin percentages, as was to be expected, as they all had acute tuberculosis. A comparison of table 3 with table 5 will reveal the differences in the two types of cases.

Table 4 reveals five things of interest: the percentage of polymorphonuclears is rather high; that of small lymphocytes is normal, or slightly below; that of large lymphocytes is markedly increased; that of transitionals is about normal; and that of eosinophiles is very greatly reduced. If this table is compared with table 6, it will be seen that considerable difference exists. In table 6 there is seen to be, usually, a marked increase in small lymphocytes, with a corresponding decrease in polymorphonuclears; a slight increase in large lymphocytes; usually a slight diminution in transitionals; and a diminution in eosinophiles.

The writer has observed that in uncomplicated pellagra the small lymphocytes seem to be increased in proportion to the severity of the skin lesions, though this does not always hold good. He has also observed that the more chronic the case, the more small lymphocytes there will be, relatively. These observations, of course, are merely speculative, as enough cases have not been seen to justify such a conclusion.

The differences between the tuberculous cases and the non-tuberculous may be summed up in the following table:

	Tuberculous cases.	Non-tuberculous cases.
Polymorphonuclears	High.	Reduced.
Small Lymphocytes	Normal or below.	Much increased.
Large Lymphocytes	Increased.	Slightly increased.
Transitionals	Normal.	Reduced.
Eosinophiles	Much reduced.	Diminished.

It is readily seen that in this series of cases at least there is considerable difference between the blood findings in cases complicated with tuberculosis and in those not complicated.

This series is too small to justify the drawing of any conclusions. The writer has been struck with one or two things in cases of uncomplicated pellagra that occur with too great a

regularity to be accidental. These are: an increase in lymphocytes, with a corresponding reduction in polymorphonuclears; and a marked diminution in eosinophiles. These variations from the normal blood-picture seem to be fairly constant. Further than this, the writer does not care to commit himself.

The results in these cases are presented with some reluctance, because they are rather at variance with the results secured by other observers. But by careful and repeated examinations, and the elimination of as many sources of error as possible, these results have become so constant that they can not seem accidental, or greatly erroneous. The separation of tuberculous from non-tuberculous cases served further to harmonize the results, and the writer is confident that the average results given in these tables are true for the cases in this hospital, at least. These figures are presented merely as statistics, and the writer does not make any attempt to draw any conclusions concerning the blood-picture in this disease.

It is to be hoped that further observation made of the blood of pellagra victims will take into account the probable complication of tuberculosis, which can occur so insidiously in this disease. It is only by ruling out tuberculosis that the blood findings in pellagra cases become intelligible.

A STUDY OF MILITARY OFFENCES COMMITTED BY THE INSANE IN THE UNITED STATES ARMY, FOR THE PAST FIFTY YEARS.*

By ROBERT L. RICHARDS, M. D.,
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When the insane person has come in conflict with the law he has always claimed our attention, whereas in other relations in life he is often concealed or ignored. This question has, therefore, been the cause of much military investigation in which France and Germany have taken the lead.

The French have studied particularly the sociological side of the question. In the first place they have endeavored to ascertain whether these offenders belong to an easily recognized group of men which might be excluded or whether the offences are acute isolated periods of mental derangement. In the second place they have studied these cases in different branches of the service.

Rayneau[1] has collected the following statistics as to the relative frequency of military and civil offences.

Quinquenial Periods.	Military Offences.	Civil Offences.
1888 to 1892	One in 125 men.	One in 685 men.
1893 to 1897	One in 131 men.	One in 738 men.
1898 to 1902	One in 159 men.	One in 999 men.

The greater frequency of military offences is generally accepted as due to the greater requirements of military life and the closer observation of soldiers by their superiors.

Jourdin[2] from a study of a ten years period of two regiments found that military offences were from 2 to 5 times more frequent among the volunteers than among the conscripts, *e. g.*

		54th Reg. Infantry.	2nd Dragones.
Companies of Disciplin..	Conscripts	10.28%	8.28%
	Volunteers	18.31	43.24
Deserters	Conscripts	4.39	11.05
	Volunteers	8.13	30.63

* Read at the sixty-seventh annual meeting of the American Medico-Psychological Association, Denver, Col., June 19-22, 1911.

In general the statistics of the German army show the same relative proportions of conscripts and volunteers. In both countries authors explain the relatively larger numbers of discharges for insanity in the same period in England (1.3%), United States (1.6%), and Belgium (2.33%), by the fact that service in these countries was entirely voluntary. But closer study of the French statistics shows that including officers and non-commissioned officers they would have 1.8% instead of 0.5%. Besides, while in these countries compulsory service does give a better general average of men and volunteer service does attract a great many defective and undesirable men, still we agree with English writers that our volunteers cannot be classed with their volunteers or foreign legionaries. We know the patriotic motives that actuate our men, and we find a much smaller percentage of those who enlist because they are unsuccessful or because the community or their families wish to get rid of them. It is also evident that the better pay and the better prospects of promotion make our army a more attractive career. Consequently, it seems probable that we start on more nearly the same basis than French or German authors have been willing to admit. Each country has to do with an unstable defective element that comes in conflict with the military law and that should be considered separately and distinctly from the general class of military offenders.

In addition the French find that different branches of the service furnish different proportions of insane and offenders. Granjux[8], from a study of the latest published military statistics of the French army (1906), has collected the following important facts. While the discharges for insanity in the army in France were only 0.5%, the "African Battallion" (les joyeux of Jude[9]) showed 0.7%, the military prisons and penitentiaries 1.4%, the volunteer "foreign legion" 2.5% and the "companies of disciplin" 2.8%. From this it is evident that the greater number of discharges for insanty was among those not amenable to discipline and the volunteer foreign legion, *i. e.*, 3 to 6 times more than the army in France.

The Germans have studied particularly the psychiatric side of the question. Becker[5] had studied the "weak minded" in the German army. He found that 50% of the rejections for mental deficiency in 1905-1906 were for weak-mindedness (305 weak-

minded and 305 insane were discharged). Stier[8] has studied the relation of alcohol to military offences and the circumstances connected with desertion and absence without leave. Certain forms of mental disease have been noted to be especially associated with these offences—notably, dementia præcox, degenerative and alcoholic psychosis.

Before studying this subject farther, it is well to recall that military and civil courts differ materially. Military courts have fewer technicalities and study both the offender and the evidence of offence. Civil courts have many more rules as to evidence and study the offence first, the study of the offender being restricted in many ways. The military offender's life since enlistment is known in relation to certain general and complete standards, with which the military court is thoroughly familiar. In case of doubt arising, as to a soldier's responsibility for his acts, the military surgeon is an impartial source of information to aid the court in reaching its conclusions. One of the great modern advances in military medicine is the attempt to give the military surgeon a special knowledge of mental diseases and their manifestations. To prevent injustice in the cases under consideration, he must be able to recognize and give the proper value to all departures from the normal man. In addition to this general knowledge, experience in those European countries, where military psychiatry is most advanced, shows that a certain number of these cases require longer study and more special experience than the average surgeon can give them. Hence, these countries have unanimously agreed that at least one especially qualified surgeon should be stationed at each army corps headquarters to study and decide upon these difficult cases. This, in practice, consists in Germany of a psychiatric department in connection with a large general hospital. About six weeks is considered the usual time necessary for the study of an average case by the Germans.

The more difficult ones are kept under observation until a conclusion is reached irrespective of the time. Such an arrangement commends itself as being impartial and competent. On the other hand, the experience of civil courts has become more and more unsatisfactory. Recently, at a meeting of the New York Bar Association, one lawyer recommended that all cases be tried irrespective of the mental condition or the accused's responsibility—

the only point to concern the court being, did the accused actually commit such an act? The question of responsibility would subsequently be passed upon by a board of alienists.

Since the military insane have been and are transferred to the Government Hospital for the Insane at Washington, D. C., we may, in the records of this institution, study in a general way the offences committed by the military insane. While we do not find here a record of all the military offences, still we do find the more serious offences which were associated with the final mental collapse. The records here contain, among other data, the final discharges of cases still here and the abandoned discharges of those who have recovered. Naturally recovered cases abandon "dishonorable" and "without honor" discharges, and those showing military offences more frequently than discharges with "good" or better characters. Of all these discharges, I have selected only those cases that came directly from the army to this hospital and have included none of the cases that came here from the different national soldiers' homes.

Case histories have been more complete during the past seven years and furnish additional evidence of military offences for this period.

In this way, I have selected 500 discharges in the period 1860 to 1909. Of these discharges, 308 (61.6%) belong to the present decade, and 192 (38.4%) belong to the preceding four decades. The percentage of "dishonorable" and "without honor" discharges and of those showing military offences (chiefly desertion) for the whole period is 12.6% (62 cases) which are distributed in relatively the same proportions in the two periods, *i. e.*, 66% in the present decade and 34% in the preceding decades. We may compare this with a German record of 1190 cases of mental disturbances, under observation in the year 1905-06, which were studied with reference to injury of the service. One hundred and four cases (8.7%) of service injury were noted in the 1190 cases of mental disturbance.

On examining separately the discharges of the two periods mentioned we find that this percentage, in the period 1860 to 1899, was 10.9% and, in the period 1900 to 1909, was 13.3% discharges showing military offences. This is due partly no doubt to our recognizing during the past decade more of the cases of military

offences associated with mental disturbance. But among the 663 histories studied for the period 1902 to 1909, I find 67 additional cases of military offences, of more or less gravity, which were elicited in writing the histories. This shows that our figures are below the facts in the case. We must admit an increase in the number of offences committed by the insane. We are both seeing and recognizing more cases of this sort in the past decade.

Judging from the characters recorded in these 500 discharges, the general estimate of the discharged insane remained the same throughout these five decades, *i. e.*, 85% of the characters were "good" or better. The manner of severing our relations with these men has, however, changed, materially. During the first two decades they were retained in the service until the expiration of their enlistment and they received all allowances. The next two decades they were discharged within a few months of their transfer to the Government Hospital for the Insane. During the present decade, the discharges and histories indicate that, in addition, certain cases were discharged "without honor" because of etiological factors which were considered to be their own misdeeds.

Although we discharge these cases more critically and are discovering a larger percentage of them in the present decade, still our preventive measures are no more successful than they were and we have a larger percentage than countries where more thorough preventive measures are employed. As a result of the studies of Germany since 1870 and France since 1890, it is unanimusly agreed that the place where these cases should be eliminated is before and not at the court martial. It is also agreed that the earlier symptoms are noted in the companies and that the company commander and the surgeon have the best opportunity to study these cases. They, working in harmony, should be able to eliminate the majority of these cases before they have committed any of these offences. The defects of these men often make them the objects of barrack-room jokes. Their duties are difficult or impossible. They are often in conflict with the constant obedience and surveillance which are daily experiences of the soldier. Many times they regard the hospital as a haven of refuge and endeavor to secure admission. If recognized, some of them with help will improve and be able to adapt themselves to military life. Un-

recognized, they pass through the usual course of succeeding court martials until they reach the military prisons. Psychical defects are as important as physical defects. The locomotive is useless without steam, but it is dangerous as well as useless without the mind to guide its energies. The demands of the army are such that we must know exactly the factors with which we have to deal and each man in the army must correspond to minimum requirements at least.

It is noteworthy that it is not the man worn out with years of service but a defective young man who figures in this list.

TABLE I.

AGES OF MILITARY INSANE AND INSANE MILITARY OFFENDERS.

	25 years or less	26 to 30 years	31 to 35 years	36 to 40 years	41 to 45 years
1102 insane.....	42 %	30 %	15 %	6 %	7 %
Military offenders...	42.6 %	35.3 %	13.2 %	4.4 %	4.4 %

Table I shows that 77.9% are under the age of 35 years wherein they correspond closely with the average age of the military insane. These men have thus early in life proven themselves so defective that they have been cast aside. We may hope that with careful study of the individuals not one out of every eight will have also an unsavory discharge because of military offence.

In the second place it is noteworthy that 92.9% were discharged in their first enlistment period because of insanity and that 94.98% of the military offenders belong to their first enlistment period.

Table II shows that in this group of 500 cases the offences became most prevalent towards the close of the first enlistment period while the general admission rate for insanity was highest at the end of the first year. Instead of military life having an educational effect upon these cases and developing the weaklings, we find the reverse. They are incapable of so rapid a development. The restrictions become more and more irksome and there defects become more and more evident. In this manner we see that the percentage of more serious offences increases rapidly and reaches a climax at the 2½ year period. This is material which cannot be utilized and the longer we retain it the more dangerous it becomes.

The third point attracting our attention is the character of the offences committed. In our records we have the offences associated with the collapse of the case. The histories of the cases when available show many previous offences of absence without leave, etc., which are usually heard in the summary court.

TABLE II.

LENGTH OF SERVICE: PERCENTAGES OF INSANE AND OFFENDERS.

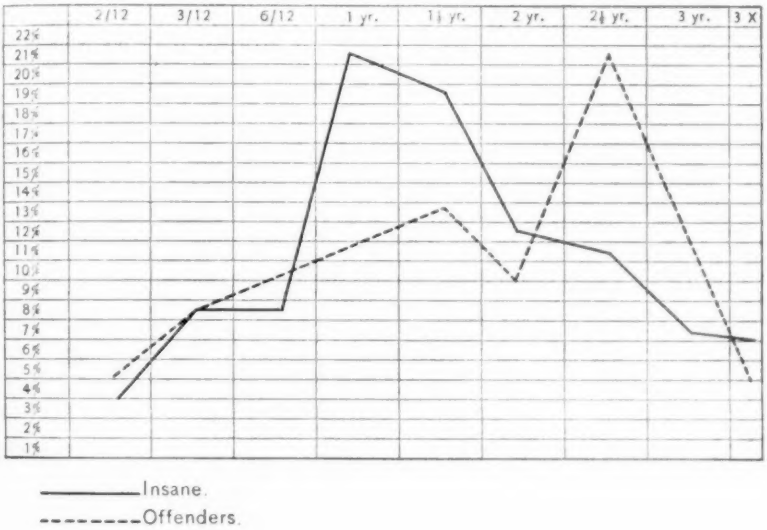
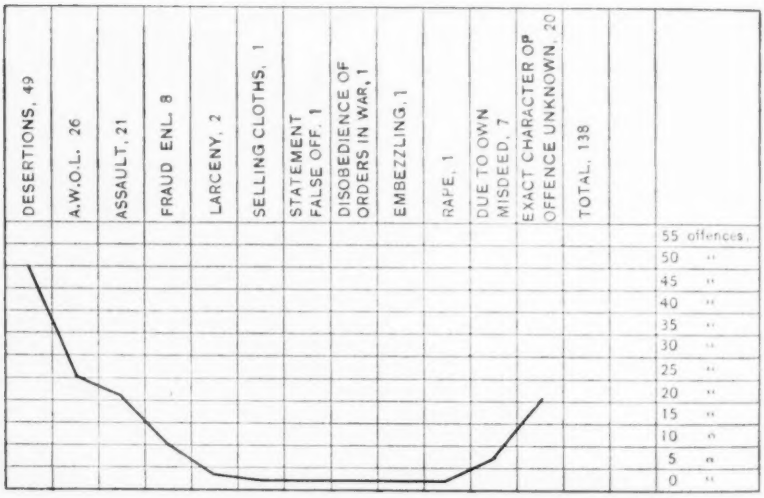


Table III shows the character of 138 offences of which we have found record on the discharge or histories. The relative results are the same if we divide these into a group corresponding to more complete histories and a group having only the discharges as available records. Besides it corresponds with reports from other countries where the same offences predominate. Forty-nine desertions and 26 A. W. O. L. make 75 offences differing rather in degree than in quality and composing nearly one-half of all the offences. It is the characteristic route of the defectives when they are pushed too far. They cannot do their duties properly. They are the laughing stock of the company. Delusions of persecutions gather to sustain their self-respect. They become more and more

irritable, secluding themselves and seeking amusement elsewhere —often under demoralizing influences. Finally they overstay the coveted leave and realize that they have become deserters. Many times under the guidance of auditory hallucinations they pass through an episode of excitement and finally at some quiet place they settle down to a life more within the range of their possi-

TABLE III.

CHARACTER OF OFFENCES.



bilities. During the excitements assaults are very common when they turn upon their imaginary enemies or give way to the blind impulsive anger so characteristic of this group. Of those who escape apprehension some fail to find a place where they can live after the period of excitement has subsided. Life proves more difficult than they expected and their thoughts, time and again, turn to the barracks where they had never gone hungry and everything was provided for them. At a different post under an assumed name they again enlist and become guilty of the fourth most frequent offence of fraudulent enlistment. The other offences in the table are more in the nature of accidents and we have a record of only one each.

Rayneau notes the following offences among the defectives of the French army as being those of an especially military character.

1. Not reporting for duty.
2. Illegal absences, leaving post, desertion.
3. Sleeping on guard.
4. Habitual lack of discipline, insubordination, refusing obedience, violent attacks and revolts. Simulation of insanity and self-mutilation are also common among the defectives of the French army.

The offences or misdeeds leading to "without honor" and no or qualified character discharges deserve special consideration. The offences noted are similar in the two classes, *i. e.*, desertion 19, fraudulent enlistment 5. The misdeeds noted are previous attacks of insanity, which would have prevented enlistment, alcohol, syphilis, and opium. All but one of the 16 "without honor" discharges are found in the period 1900-1909. All but three of the 15 no or qualified character group belong to the period 1860-1899. On the face of it they are all cases in which the time for observation and the opportunity for study were not sufficient to completely determine their responsibility. Particularly is it difficult or impossible to establish the value of an apparent etiological factor such as alcohol, opium, syphilis, etc., when judgment is rendered from a knowledge of only the early manifestations of the mental disease. Since these cases pass from military observation on transfer to the Government Hospital for the Insane and in the majority of cases the character is determined within a short period after their transfer, it seems a manifest impossibility to determine these cases equitably. Since in all of these cases there is an evident doubt and reservation in reaching a decision, the obvious conclusion is that there is need of further study and observation before their relations to the army can be entirely equitably settled.

The Germans have one standard covering civil and military cases which is worthy of our consideration.

Sec. 51, R. St. G. B. (7) says "A punishable action is not present, if the person at the time of accomplishing the action was in a condition of lack of knowledge of his surroundings, or a morbid

disturbance of the intellect because of which the free use of his will was excluded." The accused is supposed to have the benefit of the doubt in these decisions.

Becker studied 25 cases of military offences among those entitled to the protection of the above law and found:

16 cases of absence without leave and desertion.
6 cases of disobedience of commands.
2 cases of disrespect to superiors.
1 case of assault.

The fourth point claming our attention is the character of the mental diseases found amoung these offenders. In 1908 the German Government [8] published a book covering the question of the relation of mental diseases in the year 1905-06 to service injuries or offences (Dienstbeschädigung). 1190 cases came under observation that year and 104 of them had been an injury to the service. The details are shown in the following tabulation.

	Observed.	Injured the service.
Congenital weak minded	615	1
Psychopathic constitution and insanity of degeneracy	100	..
Dementia præcox	204	44
Manic depressive insanity	11	..
Acute hallucinatory psychosis	41	13
Melancholia	41	8
Mania	15	5
Epileptic insanity	69	7
Hysterical insanity	30	3
Traumatic insanity	6	3
Alcoholic insanity	7	..
Chronic paranoia	18	4
Paresis	12	11
Unclassified	21	5
	1190	104

When we compare our list of 122 cases associated with military offences with this list of 104 cases of injury to the service we find a striking similarity. Congenital weakmindedness is not included in our list, however, since those cases were discharged without reaching the Government Hospital for the Insane.

	Our cases.		German cases.
Dementia præcox	62 cases	= 50.82%	42.3%
Alcoholic phychosis	13 "		
Manic depressive	9 "		
Acute confusional insanity	8 "		
Chronic mania	6 "		
Epileptic psychosis	4 "	= 3.2%	6.73%
Paranoid states	4 "		
Dementia	3 "		
Intox. psychosis	3 "		
Paresis	2 "		
Psychopathic characters	2 "		
Not insane at Government Hospital	2 "		
Hysteria	1 "		
Acute melancholia	2 "		
Imbecile	1 "		
	122		

It is very interesting to note that the dementia præcox cases occur in the early part of their service and the alcoholic cases in the latter of their service.

It shows that dementia præcox cases are defective to begin with and the alcoholic cases acquire their defect through prolonged abuse of alcohol.

The following table shows the different periods of service:

TABLE IV.

PERIODS OF SERVICE FOR BEGINNING OF TWO MOST FREQUENT MENTAL DISEASES.

Dementia præcox		Service	Alcoholic psychosis	
Number of cases	Percentage		Percentage	Number of cases
22	35.84 %	1 yr. and less	0	0
34	54.83 %	2 yr. and less	23 %	3
55	88.7 %	3 yr. and less	38.46 %	5
7	11.29 %	3 yr. and over	61.5 %	8
62	99.99 %	Total No. cases	99.96 %	13

The balance of the cases correspond with the general average in Table III.

1 year	and under	14 cases	29.78%
2 years	and under	23 cases	48.93
3 years	and under	36 cases	79.59
3 years	and over	11 cases	23.4
Total		47 cases	99.99%

Thus cases of dementia præcox and alcoholic psychosis form the group in which all students of military psychiatry are especially interested. The men who have not the mental endowment to remain in the service are to be eliminated as soon as possible.

Kraepelin[9] says that alcoholic psychoses do not occur in proportion to the degree and duration of alcoholism. He finds as etiological factors in his cases besides the use of alcohol an increased susceptibility, an inherited predisposition, and certain metabolic factors which are not yet understood. These cases relapse in the majority of cases on again indulging in alcohol. These cases form a class by themselves and should be judged separately. Besides the early stages of other mental diseases (notably dementia præcox and degeneration psychosis) may be associated with alcoholic excesses when the alcoholic indulgence has a more accidental connection.

Manic-depressive insanity is often hereditary and the outbreak of an attack is generally associated with great emotional disturbance, or exhaustion, or additional strains, or certain other factors not as yet fully understood. A knowledge of these cases will enable us to place them under proper care before a violent outbreak has occured.

Acute confusional insanity is associated often with bodily diseases, exhaustion, prison life, catastrophies, battles, etc. We must be prepared to meet them under such conditions.

The other mental diseases in the list are more in the nature of accidents such as may occur in any large body of men and which we do well to bear in mind.

Since military cases offer a large percentage of recoveries (about 57%[10] in the experience of the Government Hospital for the Insane) not only do we have in these cases the opportunity by early recognition to prevent their becoming criminals, but we also increase greatly the chances of recovery. We can be even

more successful in this since no body of men is under such close and continuous observation as the soldiers.

LITERATURE.

1. Rayneau: Les Aliens dans l'armee, 1909, L'Encephale.
2. Jourdin: De la valeur physique et morale des engages volontaires. Caducee, 1903.
3. Granjux: L'alienation mentale dans l'armee, 1909, Caducee.
4. Jude: Les degeneres dans les battallions d'Afrique, 1907, Caducee.
5. Becker: Der angeborne Schwachs in seinen Beziehungen zum Militärdienst., 1910.
6. Steir: Die akute Trunkenheit mit besonderer Berücksichtigung der Militärischen Verhältnisse, 1907.
7. Zeihen: Psychiatrie, 3d Auflage.
8. Anhalts—Pünkte zur Beurteilung der Frage der Dienstbeschädigung bei Geistes-kranken und Heersangehörigen, 1908.
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10. Richards: The Military Surgeon, November, 1909.

REPORT OF THE MEDICAL COMMISSION APPOINTED TO EXAMINE INMATES OF THE MATTEAWAN, N. Y. STATE HOSPITAL.

To the Honorable William Church Osborn and George E. Van-Kennan, Commissioners to Examine State Departments.

GENTLEMEN: In obedience to your request to make an examination of the inmates of the Matteawan State Hospital, with a view to determine whether any "persons are confined therein who are fit for discharge, or for being sent to trial, as the case may be," we have the honor to report as follows:

At the beginning of our investigation, the inmates of the hospital numbered seven hundred ninety-three. Of this number, we were able to examine without difficulty seven hundred sixty-one. As will appear further on, thirty-two refused examination, but these were seen by us and questioned. The examinations were made on April 11, 12, 13, 14, 19, 20, 21, 22, 1911; and the results are given in detail further on in our report, with comments on nineteen cases which seemed to us to call for special consideration.

In one instance, a vicious assault was made in our presence by a violent paranoiac upon an attendant, which illustrates the dangers to which attendants, and, indeed, the officers of the institution, are exposed in the performance of their duties. These dangers are all the more serious as there is an eminently proper rule of the hospital which forbids attendants to carry any weapon or implement of defense; so that they must rely entirely on their coolness, judgment and physical strength in cases of violence by these dangerous and irresponsible persons. A recent murderous attack upon the superintendent by an apparently harmless inmate shows that no one in the institution, who is brought in contact with patients, is free from danger to life or limb. It is to be remembered that nearly forty-six per cent (362) of the inmates were guilty of crimes against the person, including eighty-seven cases of murder in the first degree. In the large majority of cases, these offenses were committed by paranoiacs suffering from delusions of persecution; and all alienists are agreed that the "persecuted paranoiac" is the most dangerous of the insane. These para-

noiacs usually present no mental deterioration; and they are cunning enough to deceive the ordinary observer in regard to their mental condition, which may in a measure account for the aid they often receive from lawyers, courts and the laity, in their efforts to obtain release when confined in institutions.

It is easy to understand that in an institution which contains three hundred sixty-two insane who have committed offenses against the person, many of these being homicides, by persons still homicidal, a discipline must be maintained, much more rigid than is necessary in a civil hospital. The intelligent paranoiacs especially are in a condition of constant unrest; and even one or two leading spirits of their number may so work upon this dangerous element as to render its repression and control extremely difficult. One case in the hospital, which has not been specially referred to elsewhere in our report, is a striking illustration of this:

A Sicilian, who is described in our report of examinations as a "homicidal paranoiac," became possessed of a revolver and a number of cartridges. He also had obtained some strips of iron which he had fashioned into sharp-pointed stilettos and given to certain other inmates. Information of this was given to one of the medical officers by an inmate who refused examination but was recorded as "showing paranoid delusions." While not giving absolute credit to this revelation, which included a story of a plot to murder the superintendent and the first assistant physician, the physician-in-charge caused several searches of the accused to be made at certain intervals. Finally, a general search of the ward was made at an unexpected time, and the weapon was found in a bag belonging to the Sicilian. It had been observed that this man had been friendly with some of the most intelligent and troublesome of the homicidal inmates. He and the inmate who disclosed the alleged plot were interrogated by us. It has thus far, however, been found impossible to ascertain how the man obtained the weapon. His own declarations as to this were not regarded as trustworthy. The man now claims that the officials of the hospital are prejudiced against him, that he is sane and that he should be returned to the courts for trial. He is now clearly insane, cunning, plausible, vindictive, irritable and very homicidal. We believe that the spirit of unrest and resistance to discipline is fostered by popular agitation on the question of management of the

hospital; as patients are well informed on this subject, having free access to the newspapers.

While, perhaps, it was not expected that we should make suggestions or recommendations in regard to the general management of the hospital, we feel inclined to note certain changes that we think would be beneficial:

(1) A certain number of harmless dements, who are able to do some work and do not require the strict discipline to which all inmates are subjected, might be removed from the building and segregated in a detached building outside of the hospital enclosure. This would in a measure relieve the present congestion of the wards.

(2) Under the insanity law, all female convicts becoming insane while undergoing sentence are sent to Matteawan. It would be for the good of this institution if, at least, female convicts becoming insane while undergoing sentence of more than one year should be sent to the Dannemora State Hospital, the same as male convicts. The mixing of the old convicts with those indicted for a misdemeanor or undergoing sentence of one year or less is not desirable.

(3) A careful review of the personnel of the hospital might result in the transfer of a few inmates to other institutions or possibly to the care of friends. Such an investigation we did not attempt; and, indeed, it was beyond the scope of our instructions.

It is but fair to the hospital to say that in no instance did we find an inmate wrongfully detained or one subjected to inhuman or improper treatment at the hands of officers or attendants.

With this introduction, we now pass to the list of inmates examined, following a tabulated classification of the offenses with which they were charged:

	April 18, 1911.	
Crimes against person	362	45.88%
Crimes against property	231	29.28
All others	196	24.84
Total population	789	100.00%

Thirty-two of the seven hundred and ninety-three inmates refused examination. All those who refused were seen by us and informed that any statement or complaints they wished to make would be heard and considered, but that a formal examination was

not compulsory. In a few of these cases, what was equivalent to an examination was made and a diagnosis was recorded; but in most instances the fact only of refusal was noted.

A complete and detailed diagnosis as to the exact form of insanity was not attempted except in a few rather obscure cases. For example: Cases of true paranoia and cases of what is now called the paranoid form of dementia præcox were all recorded as paranoia; but most cases in which delusions of persecution or conspiracy were noted as prominent were cases of true paranoia. In all but a few of the cases of dementia, the form of insanity which led to the demented condition was not noted. In all cases, the diagnosis was made by us independently, without reference to the diagnosis made and recorded by the superintendent and the assistant physicians; but it is proper to state that no substantial difference of opinion existed in any case. We—your examiners—made our examinations conjointly, but one assistant physician being present to introduce the patients; and in each case we consulted the hospital case records, which included histories of patients before their admission. These records were promptly furnished by the medical officers. The labor of the investigation was much lightened by this valuable assistance.

With two exceptions, three sessions were held daily—the last session, with the necessary consultations, often extending far into the night. This necessitated our acceptance of the courtesy of a sojourn in the hospital, without which the investigation would have been much more prolonged. We were given to understand, however, that we were in this the guests of the State.

Everything said and done during our examination was taken by a stenographer; and his records are held for possible future reference in special cases.

As regards complaints, all patients were asked if they had any complaints to make other than the bare fact of their detention. It is well known to alienists that practically all the insane do not recognize their mental condition and believe that they are sane and wrongfully confined. Where no records of complaints appear, no complaints were made that were not either delusional or manifestly frivolous or unfounded. In nearly all instances patients said that they had no complaints to make.

(Signed) CARLOS F. MACDONALD, M. D.,
AUSTIN FLINT, M. D.

Proceedings of Societies.

AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.

PROCEEDINGS OF THE SIXTY-SEVENTH ANNUAL MEETING.

DENVER, COLO., MONDAY, JUNE 19, 1911.—FIRST SESSION.

The Association convened at 10 a. m. in the Committee Room of the Brown Palace Hotel, Denver, Colo., and was called to order by the President, Dr. Charles W. Pilgrim, of Poughkeepsie, N. Y.

THE PRESIDENT.—I have the honor to announce the opening of the sixty-seventh annual meeting of the American Medico-Psychological Association, and it is also my great pleasure to introduce Governor John F. Shafroth who will deliver the address of welcome.

Governor Shafroth spoke somewhat at length of the material resources of the state, and extended a cordial welcome to the Association to visit and inspect its many and varied interests.

Owing to the absence of Hon. Robert W. Speer, Mayor of Denver, the Association was welcomed in behalf of the city of Denver by Dr. Robertson, President of the Board of Supervisors, and acting mayor of the city.

REPORT OF THE COUNCIL TO THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.

DENVER, COLO., June 19, 1911.

The Council met on the evening of June 18, 1911, in the Brown Palace Hotel.

The Council recommends for election to Active membership the following named physicians:

Robert S. Carroll, M. D., Asheville, N. C.; George B. Gale, M. D., Butler, N. J.; Arthur S. Hamilton, M. D., Minneapolis, Minn.; D'Orsay Hecht, M. D., Chicago, Ill.; Arthur P. Herring, M. D., Baltimore, Md.;

Daniel P. Hickling, M. D., Washington, D. C.; Ernest Jones, M. D., Toronto, Can.; S. Adolphus Knopf, M. D., New York, N. Y.; Robert L. Richards, M. D., Washington, D. C.; George H. Riggs, M. D., Ijamsville, Md.; Elizabeth C. Spencer, M. D., Norristown, Pa.; Roy McLean Von Wert, M. D., New Orleans, La.; Edward P. Busse, M. D., Madison, Ind.; O. O. Fordyce, M. D., Athens, Ohio.; Luther M. Halsey, M. D., Williamstown, N. J.; John H. W. Rhein, M. D., Philadelphia, Pa.; G. Wiltse Robinson, M. D., Kansas City, Mo.

The Council recommends the transfer of the following named Associate members to the Active class:

T. L. Long, M. D., Cherokee, Iowa; Robert P. Winterode, M. D., Crownsville, Md.; Benjamin W. Baker, M. D., Laconia, N. H.; James V. May, M. D., Binghamton, N. Y.; Harry L. Barnes, M. D., Wallum Lake, R. I.; Jesse C. Coggins, M. D., Laurel, Md.; Cornelius De Weese, M. D., Laurel, Md.; George Donohoe, M. D., Knoxville, Iowa; A. E. Douglas, M. D., Nashville, Tenn.; Guy G. Fernald, M. D., Concord Junction, Mass.; Frederick L. Hills, M. D., Bangor, Me.; Ethan A. Nevin, M. D., Newark, N. Y.; C. A. Porteous, M. D., Montreal, Can.; Harry R. Hummer, M. D., Canton, S. D.; E. L. McCafferty, M. D., Mt. Vernon, Ala.; W. D. Partlow, M. D., Tuscaloosa, Ala.; Lena A. Beach, M. D., Cherokee, Iowa.

The Council recommends that the following named physicians be elected to Associate membership:

Joseph Smith, M. D., Brooklyn, N. Y.; W. F. Lorenz, M. D., Mendota, Wis.; Melvin J. Rowe, M. D., Kalamazoo, Mich.; Hugh H. Dorr, M. D., Athens, Ohio.; Howard A. La Moure, M. D., Pueblo, Col.; William C. Porter, M. D., Poughkeepsie, N. Y.; Howard P. Carpenter, M. D., Poughkeepsie, N. Y.; Adelbert C. Matthews, M. D., Poughkeepsie, N. Y.; Louis K. Henschel, M. D., Greystone Park, N. J.; Pauline M. Leader, M. D., Clarinda, Iowa; Esther S. B. Woodward, M. D., Westborough, Mass.; John Williams Mobley, M. D., Milledgeville, Ga.

The Council has received the following applications for active membership. In accordance with the constitution, final consideration of these will be deferred until next year:

Daniel D. Lustig, M. D.; Alfred Gordon, M. D., Philadelphia, Pa.; Jose A. Malberty, M. D., Havana, Cuba,; Frederic C. Eastman, M. D., Brooklyn, N. Y.; Herman G. Matzinger, M. D., Buffalo, N. Y.; John J. Pac Phee, M. D., New York, N. Y.; Robert P. Smith, M. D., Seattle, Wash.; F. S. White, M. D., San Antonio, Texas,; Arthur W. Rogers, M. D., Oconomawoc, Wis.; Mary E. Pogue, M. D., Lake Geneva, Wis.; Guy Payne, M. D., Cedar Grove, N. J.; Edward Mellus, M. D., West Newton, Mass.; Thomas W. Salmon, M. D., New York, N. Y.

The Council has received the resignations of the following members:

Geo. L. Sinclair, M. D., Halifax, N. S.; G. A. Mac Callum, M. D., New York, N. Y.; G. H. M. Rowe, M. D., Boston, Mass.

The Council received from Dr. Henry R. Stedman of Boston, Mass. receipted bills amounting to $156.02 covering expenses of Committee on

Expert Testimony, appointed at the 1909 meeting of the Association, and it was voted to recommend that the Association direct the Treasurer to reimburse Dr. Stedman.

The Council received from Dr. Newton M. Shaffer, Treasurer of the Congress of American Physicians and Surgeons, a statement of this Association's per capita share of the cost of the Eighth Congress held in Washington, D. C., in 1910, amounting to $423.98, and it was voted to recommend that the bill be paid but that owing to the excessive amount this Association has to pay for affiliation with the Congress the President be directed to appoint a committee of three to consider and report at the 1912 meeting as to whether we shall continue our membership in the Congress.

The Council received the following communication from Dr. Robert B. Lamb of Fishkill, N. Y. as a report of the delegates to the Eighth International Prison Congress in Washington, D. C., October, 1910, and it was voted to submit the same to the Association.

The Eighth International Prison Congress convened in the Pan-American Building, Washington, on October 2d last, the delegates being welcomed by President Taft.

The organization of this Congress was in four sections. Section One, dealt with criminal law. Section Two, with prison administration. Section Three, with the prevention of crime. Section Four, with children. The Congress itself is in reality an international legislature in which resolutions are adopted only after much debate and argument. While the adoption of these resolutions is in no sense binding on any nation represented at the Congress, nevertheless, they have the effect of defining the views of a majority of all delegates present.

While no topic presented to the Congress was directly in the realm of medicine or psychiatry, several were closely allied to it. The first was the consideration of the best method of treating persons recognized as mentally defective—especially if dangerous moral tendencies were manifested. The Congress confessed itself not ready to adopt any resolution bearing on this proposition, but recommended that further specific study be made before a resolution was moved for adoption. Recommendation was made, however, that at least one representative of medical science be included on the board having charge of the release of mentally defectives.

The treatment of the inebriate was also considered, with the adoption of the following resolution:

1. That experiments of the last ten years made in certain countries providing special establishments for the detention of habitual criminal drunkards for a long period—two or three years—have been successful.

2. That it is not necessary to complete the discipline of these establishments by special medical treatment, but it is essential to the success of the method that hygienic and medical treatment of the inmates of establishments of this class shall be directed by qualified medical practitioners.

3. That further extension of this detention of the inebriate, under State control, with a view especially to arresting the habit, is desirable.

The foreign delegates were presented with souvenir volumes edited by various American authors, and published by the Sage Foundation. These set forth the American views of the treatment of criminals at the present time.

Respectfully submitted,
ROBERT B. LAMB.

The changes in the membership of the American Medico-Psychological Association during the past year are as follows:

HONORARY MEMBERS.

Former number	23	
Died	1	
Present number		22

ACTIVE MEMBERS.

Former number	316	
Transferred from Associate	6	
Admitted	27	
Dropped	9	
Resigned	4	
Died	5	
Present number		331

ASSOCIATE MEMBERS.

Former number	143	
Admitted	14	
Transferred to Active	6	
Dropped	7	
Died	1	
Present number		143

Honorary	22
Active	331
Associate	143
Total	496

On motion, which was duly seconded, the report of the Council was accepted and adopted. The names of the physicians proposed for election to come up to-morrow in regular course.

THE PRESIDENT.—We will now hear the report of the Treasurer.

Report of Treasurer 1910-1911.

DEBITS.

Balance on hand May 3, 1910	$3,355.25
Dues from active members	1,703.10
Dues from associate members	267.25
Interest on bank deposits	99.62
Reimbursement for reprints	23.55
Gummed lists of members	10.00
Advance dues from candidate for membership	5.00
Copy of Transactions and postage on same	1.20
Total	$5,464.97

CREDITS.

1910			
May	13.	E. S. Graney, freight	$ 1.40
	18.	Wm. A. White, committee of arrangements	50.25
	19.	F. B. Dresslar, expenses	68.50
	20.	Mersereau Printery, stamped envelopes	32.00
	27.	Robt. J. Powers, stenographer, expenses at annual meeting, 1910	58.90
June	2.	George M. Kline, M. D., refund	5.00
	3.	Mersereau Printery	16.41
	6.	Edward N. Brush, American Journal of Insanity	300.00
Aug.	19.	Lord Baltimore Press, Transactions, 1909	1,200.00
Sept.	7.	Lord Baltimore Press, Transactions, 1909	161.90
Oct.	14.	Oscar P. Chase, clerical service, 1909-1910	60.00
Dec.	11.	Robt. J. Powers, express charges, etc	6.54
	16.	Robt. J. Powers, stenographer, reporting meeting	70.00
1911			
Apr.	3.	Mersereau Printery, preliminary program	6.00
	16.	Robt. J. Powers, postage, freight, etc	18.82
May	6.	Lucas Brothers, Inc., cash book	1.60
	12.	Florence I. Brinkley, indexing Transactions	5.00
June	8.	Mersereau Printery, program	36.00
	10.	Robt. J. Powers, clerical service, 1910-1911	55.00
	10.	Oscar P. Chase, postage stamps	10.00
		Stamps used during year in conduct of business	5.00

CREDITS.

Balance in City National Bank, Binghamton, N. Y.	$ 602.97
Balance in Binghamton Savings Bank	1,047.36
Balance in Emigrant Industrial Savings Bank	1,646.32
Total	$5,464.97

CHARLES G. WAGNER, M. D., *Treasurer.*

June 12, 1911.

On motion the report of the Treasurer was referred to the Auditors.

THE PRESIDENT.—I now call for the report of the Editors of the AMERICAN JOURNAL OF INSANITY.

To the American Medico-Psychological Association:

GENTLEMEN.—The statement of the Johns Hopkins Press, publishers of the Journal shows a comfortable financial status notwithstanding the reduction in the price of the Journal to members of the Association.

There are still many members who do not subscribe for the Journal who should, it is felt, show their interest in the literature of psychiatry and in the official organ of the organization to which they belong by at once sending in their subscriptions.

Not only should the names of individual members appear on our subscription list but the director of every institution for the insane in the country should see to it that the Journal is taken by the hospital which he directs for its medical library, irrespective of the fact that he and possibly one or more of his assistants are also subscribers. If every institution received and paid for the Journal for its medical library we could make a very material reduction in the price of subscription to members of the Association. It is hoped that the members will feel sufficient interest in a periodical which is their property to see that as far as each one can use any influence it will be directed to increasing our subscription list as has been suggested.

Last year we said: The editors again take the liberty of calling the attention of those who read papers at our meetings to the rule of the Association that papers presented at our meetings are the property of the Association and can not be published except in the Transactions of the Association or the Journal of Insanity except by specific permission of the Council of the Association. The editors are frequently asked by authors of papers for permission to publish their contributions in some medical journal. It should be clearly understood that the editors have no power to grant such permission. It would certainly appear, however, that having received a courteous hearing, having been accorded a place on the program of our Association, authors should give its publications the opportunity to publish their papers before offering them elsewhere. This would seem particularly applicable to contributors of papers, not members of the Association, who have been given a hearing at the meetings of the Association. Readers of papers should also place their papers as soon as read in the hands of the Secretary."

The editors have addressed a communication to the Council regarding this matter and it is hoped that that body will take some action which shall more definitely define the status of papers read before the Association as regards their publication in other periodicals, and that some definite rule shall be made as to the time which shall be permitted members for the correction of stenographic notes of remarks and discussions.

Members sending articles for publication in the Journal should send them in condition which will not necessitate changes in proof except such as are necessary to correct typographical errors. Changes in phraseology made in proof are expensive and result in delay not to say anything of vexation of spirit to the editors.

Respectfully submitted for the Editorial Board,

EDWARD N. BRUSH.

On motion the report was accepted and adopted and the vouchers referred to the Auditors.

The report of the Committee on Expert Testimony, which was presented at the meeting in 1910 and referred to the session of 1911, was taken up and adopted without amendment and the committee discharged with thanks.

THE PRESIDENT.—I have the honor of naming the following Nominating Committee: Dr. Wm. E. Dold, of New York; Dr. H. C. Eyman, of Ohio; Dr. J. M. Buchanan, of Mississipi.

Memorial notices were presented in commemoration of the following deceased members: James B. Ayer, M. D., Dwight R. Burrell, M. D., George F. Cook, M. D., William P. Letchworth, LL. D., Louis C. Pettit, M. D., James Rutherford, M. D., Bigelow T. Sanborn, M. D., Henry M. Weeks, M. D., and Uranus O. Wingate, M. D., all of whom have died during the past year.

The following members registered and were in attendance during the whole or a part of the meeting:

Allen, H. D., M. D., Superintendent Allen's Invalid Home, Milledgeville, Ga.

Applegate, C. F., M. D., Superintendent Mt. Pleasant State Hospital, Mt. Pleasant, Iowa.

Athon, W. L., M. D., Superintendent Anna State Hospital, Anna, Ill.

Betts, Joseph B., M. D., Assistant Physician Buffalo State Hospital, Buffalo, N. Y.

Beutler, W. F., M. D., Superintendent Milwaukee Asylum for Chronic Insane, Wauwatosa, Wis.

Biddle, T. C., M. D., Superintendent Topeka State Hospital, Topeka, Kansas.

Buchanan, J. M., M. D., Superintendent East Mississippi Insane Hospital, Meridian, Miss.

Burgess, T. J. W., M. D., Medical Superintendent Protestant Hospital for Insane, Montreal, Que.

Buscy, A. P., M. D., Superintendent Colorado State Insane Asylum, Pueblo, Colorado.

Busse, E. P., M. D., Medical Superintendent Southeastern Hospital for Insane, Madison, Ind.

Caples, B. M., M. D., Superintendent Waukesha Springs Sanitarium, Waukesha, Wis.

Carey, H. M., M. D., Superintendent Eastern Pennsylvania State Institution for the Feeble Minded and Epileptic, Spring City, Pa.

Crumbacker, W. P., M. D., Superintendent Independence State Hospital, Independence, Iowa.

Doherty, C. E., M. D., Medical Superintendent Public Hospital for Insane, New Westminster, B. C.

Dold, William Elliott, M. D., Physician In Charge River Crest Sanitarium, Astoria, L. I., New York City.

English, Walter M., M. D., Superintendent Hospital for Insane, Hamilton, Canada.

Eyman, Henry C., M. D., Superintendent Massillon State Hospital, Massillon, Ohio.

Givens, John W., M. D., Medical Superintendent The Northern Idaho Insane Asylum, Orofino, Idaho.

Gorst, Charles, M. D., Superintendent Wisconsin State Hospital for Insane, Mendota, Wis.

Hancker, William H., M. D., Medical Superintendent Delaware State Hospital, Farnhurst, Del.

Harmon, F. W., M. D., Superintendent Longview Hospital, Cincinnati, Ohio.

Henschel, Louis K., M. D., Senior Assistant New Jersey State Hospital at Morris Plains, N. J., Greystone Park, N. J.

Herring, Arthur P., M. D., Secretary Maryland Lunacy Commission, Baltimore, Md.

Houston, John A., M. D., Superintendent Northampton State Hospital, Northampton, Mass.

Jones, L. M., M. D., Superintendent Georgia State Sanitarium, Milledgeville, Ga.

Kilbourne, Arthur F., M. D., Superintendent Rochester State Hospital, Rochester, Minn.

Lorenz, William F., M. D., First Assistant Wisconsin State Hospital, Mendota, Wis.

McCafferty, E. L., M. D., Assistant Superintendent in Charge The Mt. Vernon Hospital, Mt. Vernon, Ala.

McCampbell, John, M. D., Superintendent State Hospital at Morganton, Morganton, N. C.

Mead, L. C., M. D., Medical Superintendent South Dakota Hospital for Insane, Yankton, S. D.

Mitchell, H. W., M. D., Superintendent Danvers State Hospital, Hathorne, Mass.

Mobley, J. W., M. D., Assistant Physician Georgia State Sanitarium, Milledgeville, Ga.

Moody, G. H., M. D., Superintendent Dr. Moody's Sanitarium, San Antonio, Texas.

Perry, Middleton L., M. D., Superintendent State Hospital for Epileptics, Parsons, Kansas.

Pilgrim, Charles W., M. D., Medical Superintendent Hudson River State Hospital, Poughkeepsie, N. Y.

Priddy, A. S., M. D., Superintendent Virginia State Epileptic Colony, Madison Heights, near Lynchburg, Va.

Prout, Thomas P., M. D., Superintendent Fair Oaks Sanatorium, Summit, N. J.

Richardson, William W., M. D., Resident Physician Department for Men, State Hospital for Insane, Norristown, Pa.

Scanland, J. M., M. D., Superintendent Montana State Hospital, Warm Springs, Montana.

Scribner, Ernest V., M. D., Medical Superintendent Worcester State Asylum, Worcester, Mass.

Semple, John M., M. D., Superintendent Eastern Hospital for the Insane, Medical Lake, Wash.

Seybert, Frank T., M. D., Physician to St. Bernard's Hospital, Council Bluffs, Iowa.

Solier, C. H., M. D., Superintendent Wyoming State Hospital for the Insane, Evanston, Wyoming.

Terflinger, Frederick W., M. D., Medical Superintendent Northern Hospital for Insane, Logansport, Indiana.

Uhls, L. L., M. D., Superintendent State Hospital for Insane, Osawatomie, Kans.

Villeneuve, Georges, M. D., Medical Superintendent St. Jean de Dieu Hospital, Montreal, Canada.

Voldeng, M. N., M. D., Medical Superintendent Cherokee State Hospital, Cherokee, Iowa.

Wagner, Charles G., M. D., Superintendent Binghamton State Hospital, Binghamton, N. Y.

White, Moses J., M. D., Medical Superintendent Milwaukee Hospital for Insane, Wauwatosa, Wis.

Wilgus, Sidney D., M. D., Superintendent Elgin State Hospital, Elgin, Ill.

Winterode, Robert P., M. D., Superintendent Maryland Hospital for the Negro Insane, Crownsville, Md.

Witte, Max E., M. D., Superintendent Clarinda State Hospital, Clarinda, Iowa.

Woodbury, Frank, M. D., Secretary Committee on Lunacy of Pennsylvania, 218 So. 16th St., Philadelphia, Pa.

Woodsore, C. R., M. D., Superintendent and Physician in Chief, Dr. C. R. Woodsore Sanitarium, St. Joseph, Mo.

Work, Hubert, M. D., Proprietor and Superintendent Woodcroft Hospital, Pueblo, Colorado.

Zeller, George A., M. D., Superintendent Peoria State Hospital, Peoria, Ill.

The following visitors and guests of the Association registered their names with the Secretary:

Beutter, W. F., Mrs., Hospital for Chronic Insane, Wauwatosa, Wis.

Bodenstab, William H., M. D., Bismarck Hospital, Bismarck, N. Dakota.

Campbell, C. Macfie, M. D., Associate in Clinical Psychiatry, Psychiatric Institute, Ward's Island, New York City.

Frisby, Almah J., M. D., Member State Board of Wisconsin, Milwaukee, Wis.

Gillson, John T., M. D., Member Medical Committee, Board of Managers, New Jersey State Hospital at Morris Plains, N. J., Paterson, N. J.

Gorst, Charles, Mrs., Mendota, Wis.

Kern, W. B., M. D., Superintendent Nebraska State Hospital, Hastings, Neb.

Lewis, J. M., Cleveland, Ohio.

Payne, Guy, M. D., Medical Superintendent Essex County Hospital for the Insane, Cedar Grove, N. J.

Percival, Joseph P., M. D., Superintendent, Dunning, Ill.

Pettijohn, A. C., M. D., Medical Superintendent State Hospital No. 2, St. Joseph, Mo.

Qund, Fred B., Trustee of Medfield Insane Asylum, Boston, Mass.

Scribner, Paul W., Worcester, Mass.

Sherman, Adin, M. D., Superintendent Northern Hospital for Insane, Winnebago, Wis.

Sights, H. Preston, M. D., Superintendent Western Kentucky Asylum, Hopkinsville, Ky.

Smith, H. M., M. D., Superintendent New Mexico Insane Asylum, East Las Vegas, N. M.

Taylor, Thomas F., Tuskegee, Ala.

Van Noonan, H. C., M. D., St. Anthony's Hospital, Denver, Col.

White, F. S., M. D., Superintendent Southwestern Insane Asylum, San Antonio, Texas.

THE PRESIDENT.—In pursuance to the direction of the Council I will appoint Dr. Wm. Mabon,* Dr. E. N. Brush, and Dr. C. R. Woodson a committee of three to consider and report at the 1912 meeting as to whether we shall continue our membership in the Congress of American Physicians and Surgeons.

Dr. T. J. W. Burgess, of Montreal, Canada, gave notice of motion to the following effect, that at the next meeting of the Association he would present the following resolution:

That it is in the best interests of the American Medico-Psychological Association that it should sever its connection with the Congress of

* Dr. Mabon was unable to serve and President Work appointed Dr. Wm. L. Russell to serve in his place.

American Physicians and Surgeons, and that the Secretary be instructed to give notice to the Congress that it has decided to that effect.

On motion the meeting adjourned.

Afternoon Session.

Dr. Work (presiding).—The next order of business is the reading of the President's address by Dr. Charles W. Pilgrim.

The President of the Association, Dr. Charles W. Pilgrim, read his address, "The Care and Treatment of the Insane in the State of New York," which was greeted with applause.

Dr. Work.—Dr. Pilgrim, I speak the sentiments of this Association when I thank you for this scholarly address.

Dr. Woodson.—I move that a rising vote of thanks be extended to the President for his capable address.

This motion unanimously prevailed.

Dr. Work.—I have the honor to announce that a supper will be given to the members of the Association and their wives in the Palm Room of this Hotel to-morrow evening at seven o'clock.

The following papers were then read:

"A Study of Certain Serum Reactions in the Blood Serum of General Paralytics and its Familial Aspect," by H. C. Eyman, M. D., of Massillon, Ohio. Discussed by Dr. Burgess.

"Focal Symptoms in General Paralysis," by C. Macfie Campbell, M. D., of Ward's Island, New York City, N. Y. Discussed by Dr. H. W. Mitchell.

"The Psychology of Morphinism," by J. E. Courtney, of Denver, Colo., by title.

"The Imprisonment Psychosis," by W. W. Richardson, of Norristown, Pa. Discussed by Thomas Biddle, M. D., John W. Givens, M. D., and Frank Woodbury, M. D.

On motion the meeting adjourned.

Evening Session.

Report of the Committee on the Status of Medical and Scientific Work in the hospitals of the United States and Provinces was read by the Secretary in the absence of Dr. Adolf Meyer.

DR. WOODSON.—I move that the report be received, our thanks expressed to the Committee, and that the Committee be continued.

Which motion was duly seconded and carried.

The following paper was read:

"A Duty Neglected," by J. M. Semple, M. D., of Medical Lake, Wash. Discussed by Dr. George A. Zeller, Dr. C. R. Woodson, Dr. Frank Woodbury, Dr. John W. Givens, Dr. H. W. Mitchell.

On motion the meeting adjourned.

TUESDAY, JUNE 20, 1911, 10 A. M.

The meeting was called to order by the President. After some discussion relating to re-arrangemnt of the program on account of the absence of some members, whose names appeared on the program for the presentation of papers, the President called for the report of the nominating committee. This report was presented by Dr. Dold, as follows:

The Nominating Committee has the pleasure and honor of presenting the following names, to the members of the Association; viz.:

For President, Hubert Work, M. D., of Colorado.

For Vice-President, James T. Searcy, M. D., of Alabama.

For Secretary-Treasurer, Charles G. Wagner, M. D., of New York.

For Members of the Council: H. W. Mitchell, M. D., of Massachusetts; J. W. Babcock, M. D., of South Carolina; W. H. Hencker, M. D., of Delaware; Charles Gorst, M. D., of Wisconsin.

For Auditor, S. E. Smith, M. D., of Indiana.

Wm. Elliott Dold,
Henry C. Eyman,
J. M. Buchanan.

On motion, the report of the Nominating Committee was accepted and adopted, and the Secretary was instructed to cast the ballot of the Association for the election of the officers as reported by the Nominating Committee.

The Secretary then cast the ballot as directed, and the President announced that the officers named by the Nominating Committee were duly elected as officers of the Association for the ensuing year.*

* Owing to the loss of a part of the record of the proceedings on Tuesday, June 20, the full report will be deferred until communication can be had with the stenographer. This report will appear in the Transactions.

THE PRESIDENT.—The next business before the Association is the report of the Auditors.

DR. BUCHANAN.—The Auditing Committee begs leave to submit the following report:

DENVER, COLORADO, June 20, 1911.

The Auditing Committee begs to report that it has examined the books and vouchers submitted by the Secretary and Treasurer, compared his records with the report submitted to the Association, and finds that said report is correct as submitted.

For the Auditing Committee,
J. M. BUCHANAN, *Auditor.*

On motion, the report of the auditors was accepted and adopted.

On motion, the meeting adjourned to accept the invitation of the Denver physicians to spend the afternoon seeing Denver by automobile.

On Tuesday evening the newly elected president, Dr. Hubert Work, gave an elaborate banquet to the members of the Association and their friends in the Palm Room of the Brown Palace Hotel. Immediately after the banquet the annual address was delivered by the Hon. Alva Adams, former Governor of Colorado. Governor Adams made many allusions to the work of the medical profession and his address made an excellent impression.

WEDNESDAY, JUNE 21, 1911, 10 A. M.

THE PRESIDENT.—We will now have the report of the Council.

REPORT OF THE COUNCIL MEETING JUNE 20, 1911.

The Council recommends:

That the incoming President be authorized to appoint a Program Committee for the next Annual Meeting, and also a Committee of Arrangements.

That the dues for the ensuing year be fixed at the usual rate: viz. five dollars for active members, and two dollars for associate members.

That the Secretary be authorized to publish the Transactions of this meeting.

That in accordance with custom the Secretary be authorized to reimburse Hon. Alva Adams for his traveling and hotel expenses.

That the next annual meeting be held either in Cape May, N. J., or Niagara Falls, N. Y., to be determined by the Association.*

That the date of the next annual meeting be designated later by the Committee of Arrangements.

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* Subsequently changed to Atlantic City, Marlborough-Blenheim Hotel May 28-31, 1912.

That in compliance with the request of the Editorial Board of the American Journal of Insanity the Secretary-Treasurer be authorized to pay to them during the coming fiscal year the sum of $300 or so much thereof as may be necessary for their use.

The Council has received the following applications for Active membership. In accordance with the Constitution, final consideration of these will be deferred until next year:

Charles F. Gillivan, M. D., Columbus, Ohio; John C. Mitchell, M. D., Brockville, Canada; Joseph P. Percival, M. D., Dunning, Ill.; Abra C. Pettijohn, M. D., St. Joseph, Mo.; Adin Sherman, M. D., Winnebago, Wis.; H. P. Sights, M. D., Hopkinsville, Ky.; James M. Barstow, M. D., Council Bluffs, Iowa.

The Council recommends that Earl H. Snavely, M. D., of Cedar Grove, N. J., be elected to Associate membership.

Respectfully submitted,

CHARLES G. WAGNER, *Secretary-Treasurer.*

On motion, duly seconded, the report of the Council was accepted and adopted.

THE PRESIDENT.—We will now proceed to the election of members.

On motion, duly seconded, the Secretary was instructed to cast ballots for the election and transfer of members as follows:

The following were elected to active membership.

Robert S. Carroll, M. D., Superintendent of Dr. Carroll's Sanitarium, Asheville, N. C.

George B. Gale, M. D., Medical Director Bancroft Health Resort, Butler, N. J.

Arthur S. Hamilton, M. D., Minneapolis, Minn.

D'Orsay Hecht, M. D., 103 State St., Chicago, Ill.

Arthur P. Herring, M. D., Secretary State Lunacy Commission, Baltimore, Md.

Daniel P. Hickling, M. D., Washington, D. C.

Ernest Jones, M. D., Hospital for the Insane, Toronto, Can.

S. Adolphus Knopf, M. D., New York, N. Y.

Robert L. Richards, M. D., Captain U. S. A., Presidio, San Francisco, Cal.

George H. Riggs, M. D., Superintendent Riggs Cottage, Ijamsville, Md.

Elizabeth C. Spencer, M. D., State Hospital, Norristown, Pa.

Roy McLean Von Wort, M. D., New Orleans, La.

Edward P. Busse, M. D., Superintendent State Hospital, Madison, Ind.

O. O. Fordyce, M. D., Superintendent State Hospital, Athens, Ohio.

Luther M. Halsey, M. D., Williamstown, N. J.

John H. W. Rhein, M. D., 1732 Pine St., Philadelphia, Pa.

G. Wiltse Robinson, M. D., Superintendent City General Hospital, Kansas City, Mo.

The following were elected to associate membership:

Earl H. Snavely, M. D., Hospital for the Insane, Cedar Grove, N. J.
A. E. Simonis, M. D., State Institute, Spring City, Pa.
Pauline M. Leader, M. D., State Hospital, Clarinda, Iowa.
Esther S. B. Woodward, State Hospital, Westborough, Mass.
John W. Mobley, M. D., State Sanitarium, Milledgeville, Ga.
William C. Porter, M. D., State Hospital, Poughkeepsie, N. Y.
Adelbert C. Matthews, M. D., State Hospital, Poughkeepsie, N. Y.
Louis K. Henschel, M. D., State Hospital, Greystone Park, N. J.
James G. McKay, M. D., Hospital for Insane, New Westminster, B. C.
Armitage Baber, M. D., State Hospital, Dayton, Ohio.
Joseph Smith, M. D., State Hospital, Brooklyn, N. Y.
W. F. Lorenz, M. D., State Hospital, Mendota, Wis.
Melvin J. Rowe, M. D., State Asylum, Kalamazoo, Mich.
Hugh H. Dorr, M. D., State Hospital, Athens, Ohio.
Howard A. LaMoure, M. D., State Asylum, Pueblo, Colo.

Transferred from associate to active membership:

T. L. Long, M. D., State Hospital, Cherokee, Iowa.

Benjamin W. Baker, M. D., Supt. State School, Laconia, N. H.

Harry Lee Barnes, M. D., Superintendent State Sanatorium, Wallum Lake, R. I.

Jesse C. Coggins, M. D., Medical Director The Laurel Sanitarium, Laurel, Md.

Cornelius De Weese, M. D., Medical Director The Laurel Sanitarium, Laurel, Md.

George Donohoe, M. D., Superintendent State Hospital for Inebriates, Knoxville, Iowa.

A. E. Douglas, M. D., Superintendent Central Hospital for the Insane, Near Nashville, Tenn.

Guy G. Fernald, M. D., Massachusetts Reformatory, Concord Junction, Mass.

Frederick L. Hills, M. D., Superintendent Eastern Maine Insane Hospital, Bangor, Maine.

Ethan A. Nevin, M. D., Superintendent State Custodial Asylum, Newark, N. Y.

C. A. Porteous, M. D., Protestant Hospital for the Insane, Montreal, Can.

Henry R. Hummer, M. D., Superintendent Asylum for Insane Indians, Canton, S. D.

E. L. McCafferty, M. D., Mt. Vernon Hospital, Mt. Vernon, Ala.

W. D. Partlow, M. D., The Bryce Hospital, Tuscaloosa, Ala.

James V. May, State Hospital, Binghamton, N. Y.

Lena A. Beach, M. D., State Hospital, Cherokee, Iowa.

Robert P. Winterode, M. D., Superintendent Maryland Hospital for the Negro Insane, Crownsville, Md.

After considerable discussion as to the most desirable place for the meeting in 1912, it was voted to defer action until it is learned where the American Medical Association will hold its meeting next year, and then the Council arrange for the meeting of the American Medico-Psychological Association at the same place, during the week immediately preceding, or during the week immediately following the meeting of the American Medical Association.*

Papers were read as follows:

"The Rapid Spread of Pellagra in the United States," by George A. Zeller of Peoria, Ill.

"Treatment of Pellagra," by C. C. Bass, of New Orleans, La., by title.

"Pellagra—Its Relation to Insanity and Certain Nervous Diseases," by J. W. Mobley, M. D., of Milledgeville, Ga.

Discussion by Dr. J. M. Buchanan, Dr. G. H. Moody, Dr. A. S. Priddy, Dr. M. L. Perry, Dr. Frank Woodbury.

"The Prevention of the Causes of Insanity," by Amos J. Givens, of Stamford, Conn., by title.

"A Study of Military Offenses Committed by the Insane in the United States Army during the Past Fifty Years," by Captain Robert L. Richards of the Medical Corps of the United States Army, Presidio, Cal., by title.

The President appointed the following Committee on Resolutions: A. P. Busey, M. D., of Denver, Colo.; T. J. W. Burgess, M. D., of Montreal, Can., and Dr. C. R. Woodson, of St. Joseph, Mo.

The Committee on Resolutions presented the following report, which was unanimously adopted:

Resolved, That we extend a vote of thanks to the officers of this Association, the managers of the Brown Palace, the physicians of the city of Denver and the Committee of Arrangements for the various courtesies extended in our behalf, and especially do we desire to thank Dr. Hubert Work for the banquet and entertainment given last evening, together with the pleasing address of Governor Adams.

C. R. Woodson,
T. J. W. Burgess.

On motion the meeting adjourned.

Charles G. Wagner, *Secretary*.

* Marlborough-Blenheim Hotel, Atlantic City, N. J., May 28-31, 1912.

Notes and Comment.

REPORT OF THE SPECIAL COMMISSION ON CONDITIONS AT THE MATTEAWAN STATE HOSPITAL.—One result among the many unfortunate results of the Thaw trial has been a studied and persistent attempt on the part of Thaw's friends, assisted by Thaw himself and other equally disreputable patients at Matteawan, through newspaper publications and appeals to the courts for habeas corpus writs, to convey the impression that many sane persons are kept in confinement there and that flagrant abuses of power and authority on the part of officers conspire to deprive them of comfort and proper treatment and to conceal from the world that they are thus needlessly secluded. Persons who are familiar with the degenerate with criminal instincts have no difficulty in estimating these statements and appeals at their true value, but to those who do not know the crooked ways of the degenerate they tell a plausible tale and leave an impression upon the public mind which grows into a vague idea that a great wrong is being perpetrated upon sensitive and helpless creatures. If, however, the actual facts are ascertained it becomes evident that these lamb-like and inoffensive sufferers like Thaw have been guilty of atrocious crimes, often as a fitting finale of an unbridled and discreditable life. Many, if not all, of them, if given their liberty and the society of foolishly fond relatives or friends, would probably repeat their crimes against society. The general public being of short memory has an active sympathy with the imprisoned offender, rather than with his buried and forgotten victim.

Mindful of the evils of such constant agitation against the Matteawan State Hospital, the New York State Lunacy Commission requested Doctors MacDonald and Flint, alienists favorably and widely known in New York, to examine carefully into the mental and physical condition of every committed person in Matteawan and also to report *in extenso* upon the condition and man-

agement of the hospital. These gentlemen have presented a report which will be found in this issue of the AMERICAN JOURNAL OF INSANITY. It deserves wide attention and general credence. We would express the hope that we shall, for a time at least, be spared in the public press any further calumnies upon the management of Matteawan. As long, however, as it may seem to be for the apparent interest of the friends of similar degenerates to hatch similar tales of woe and cruel wrong, they will be presented to a credulous public by an inconsiderate if not venal press. They should fall upon deaf ears.

THE REPORT ON EXPERT TESTIMONY.—The Association is to be congratulated upon the final adoption of the excellent report on Expert Testimony which was presented at the annual meeting in Washington in 1910, and ordered printed and distributed among the members for action at the meeting this year.

Some editorial comment upon this report was made in July, last year in the JOURNAL, and it is unnecessary here to again refer to its many excellent features.

At the meeting of the American Neurological Association held in Baltimore in May, 1911, a series of resolutions was adopted upon the same subject representing the attitude of that Association on the question of medical expert testimony as it relates to the neurologists of this country.

These resolutions are twelve in number and several of them are practically identical with certain of the fourteen resolutions presented with the report of the Committee of the American Medico-Psychological Association; some of the sections being taken *verbatim* from the report of the Committee of the Medico-Psychological Association.

This is a compliment to this committee, but by an unfortunate omission in the report to the Neurological Association it was not given any credit for the material taken. It now remains for these two associations to see that the good work done by their Committees on Medical Expert Testimony is not nullified by the conduct of any of their members.

MEETING OF FRENCH ALIENISTS.—The twenty-first Congrès des medicins aliénistes et neurologistes de France et des pays

de langue française was held at Amiens, August 1-7, 1911. As usual, three addresses were given besides a number of papers being read. The addresses were: Des différentes espèces de douleurs psychopathiques (leur signification, leur rôle) by Dr. G. Maillard; Des tumeurs du corps pituitaire, by Dr. M. Courtellemont; and De la valeur du témoignage des aliénés en justice, by M. Lalanne. The next congress will be held at Puy in August, 1913. The addresses announced are: Les troubles du mouvement dans la démence précoce, by M. Lagriffe; De l'anesthésie dans l'hemiplégie cérébrale, by M. Monier-Vinard; and Conditions de l'intervention chirurgicale chez les aliénés au point de vue therapeutique et médico-légal, by M. Picqué.

This year the Congress was less successful than usual owing partly to the fact that the meeting places were somewhat scattered, sessions being held at Amiens, Boulogne-sur-Mer, and at the Asylum of Prémonté. This caused the expenses of individuals attending to be nearly doubled. Another cause however is the coolness existing between alienists and neurologists on the question of the psychoneuroses, each group feeling that the other is invading their territory. This was alluded to by President Deny in his address, entitled: Les psychonéuroses et leur place en nosologie.

Meeting of the British Medical Association. Section of Neurology and Psychological Medicine.—Dr. Goodall, the president of the section, in his address, spoke of the possible toxic origin of some kinds of insanity. This was followed by a discussion on Multiple Sclerosis which was opened by Professor H. Oppenheim, of Berlin and discussed by a number, including Dr. James J. Putnam, of Boston and Dr. Eugene Bondurant, of Mobile. Another discussion upon Trauma in Relation to Nervous and Mental Affections was introduced by Dr. F. W. Mott. Professor B. Pfeiffer, of Halle, read a paper on Brain Puncture for Diagnostic Purposes, which was followed by six others. The meeting is reported as having been unusually successful, the time being devoted to discussions rather than to reports of original work. This plan has been followed by our English cousins for several years past and seems to work very satisfactorily. While the meeting of the Association was nominally held July 25-28,

1911, there had been business meetings for several days before, so that the time could be given up uninterruptedly to matters medical.

THE MEETING OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION.—Owing to the fact that the meeting of the Association in Denver was not held until June, it has been impossible to print a report of the proceedings until the present time.

The meetings were held at the Brown Palace Hotel, and the attendance, though not as large as usual, was fairly representative.

The Governor of the State, Hon. John F. Shafroth, in an address of welcome spoke at some length of the material resources of Colorado, and suggested points of interest which might be visited with both pleasure and profit by the members of the Association.

Dr. Pilgrim in his address, which was published in the July number of the JOURNAL, spoke of the care of the insane in New York State, and made a plea for curative rather than custodial care.

The report of the Committee on Expert Testimony which was presented at the meeting in 1910 was adopted without amendment, and the committee discharged. The annual address was delivered by Hon. Alva Adams, ex-Governor of Colorado, on Tuesday evening, following a banquet given to the members of the Association and its guests by Dr. Work, the president-elect. There was but a brief session of the Association on Tuesday the 20th, and none on Thursday the 22d, the program arranged for that day having been carried through on Wednesday.

Preliminary reports of the Committees on the Status of Medical and Scientific Work in Hospitals for the Insane in the United States and Provinces and upon New Laws and Legislation were made and the committees continued.

Pellagra was a topic which occupied an important place in the program and several papers were presented, some of which will appear in the JOURNAL.

The next meeting will be held in Atlantic City in May, 1912.

Book Reviews.

Ueber die sexuelle Konstitution und andere Sexualprobleme. By L. Loewenfeld. Pp. 231. (Wiesbaden: Bergmann, 1911.)

This is perhaps the most objective work upon the subject that we have. Considerable material has accumulated with regard to sex differences as they have been subject to ordinary psychological experiment, and so far as such differences have been found, they have ranked among the secondary sexual characters; individual differences in the primary characters, whether on the physiological or mental side, do not usually receive so systematic a treatment as is here afforded. This constitutes the bulk of the present volume, which is the latest of a number of the author's contributions on allied topics.

The book consists of three divisions, the first of which, "Sexuelle Konstitution" gives its name to the volume, and occupies about three-fifths its length. The original conception of this term is Freud's, although the author does not agree with this definition of it, which deals essentially with the character and conditions of sexual stimulation. The sexual constitution of an individual should be so defined as to include (1) the inception and duration of sexual functions; (2) sources of their stimulation; (3) the intensity of the impulse; (4) power of performance and resistance; (5) the secretory functions. These factors in the sexual constitution must be granted some degree of independence of the general constitution (and of each other), just as other factors in the general constitution may vary independently of each other.

In regard to the first of these topics, it is altogether probable that strictly sexual mechanisms are found in children well before the period of maturity: these are, however, not for the most part phases of the internal development of the child, but are conditioned by exogenous factors. The author takes issue with Freudian psychology more gently than most of its critics, though not less firmly. Neither in childhood, nor for that matter, in adult life, are erections necessarily of sexual origin, and infantile masturbation appears of relatively infrequent occurrence. Constitutional factors are of considerable importance as may be seen in the relatively harmless or baleful results of similar experience, such as abuse by elders. Incipient perversions are also observable in this period, but on the whole, no very great importance is attached to the sporadic episodes which may be seen in the individual prior to the commencement of the recognized physiological sexual functions, though the author is inclined to think that most writers underestimate the actualities. Attention is called to the fact that the beginning of menstruation (menarché,

Kisch) is not, as is frequently supposed, essentially dependent on climatic influences, for isolated tribes of the far North may show the menarché at twelve or thirteen years. In women of the urban population, as well as those of the higher social classes, the menarché is about one and one-half years earlier than in those of the rural or socially lower classes. In isolated cases it has been observed as early as 2 years. In like manner the menopause occurs on an average nearly 3 years later in the more than in the less favored classes, which throws the greater productivity of the latter into conspicuous relief. Among savage races menstruation is seen also to persist for a much shorter period than among civilized. As is well known, potency persists for a longer period in men, occasionally even into the seventies; and it may disappear as early as the forties. With reference to these points, some figures are given showing the distribution of the husbands' ages in the marriages of women of advanced years.

The sources of sexual stimulation are classified as somatic and psychic. The principal one of the former is, among men, unquestionably the accumulation of semen, which may find its analogue among women in certain periodic conditions of local hyperæmia. Focal irritative conditions may have similar results; chronic conditions of sexual excitement may also originate in a heightened irritability of the cord centers, as occasioned, for example, by persistent masturbation. The relation of sexual excitement to various forms of mental disease (as general paralysis, manic-depressive excitement, etc.) is also mentioned.

Aside from the local secretions, it is extremely probable that sexual stimulation occurs through the chemical action of additional substances circulating in the blood. Various observations with castrated animals, still manifesting evidences of sexual stimulation, have been thought to substantiate this view, nor are analogous observations lacking for men; the Spadones are cited in evidence, and more recent observations with the Skoptzy. In women, the ablation of the uterus and ovaries need not lead to the disappearance of sexual desire, but may even increase it.

These and other considerations bring the author to an important postulate; namely, that the intensity of the stimulation of the sexual area of the cortex, the subjective experience of which is termed *libido*, is not conditioned merely by processes originating in the essential sexual organs or by mental causes. In addition to these, are the mentioned sources of chemical stimulation, to which Loewenfeld applies the specific name of ***libidogenous substances***. Their principal origin seems to him to be in the thyroid, but many other metabolic products may be involved, whose sole function is by no means necessarily libidogenous. Brief mention is made of aphrodisiacs.

To the external somatic series are assigned the various sensory stimulations that accompany sexual reactions. The erogenic zones are those areas of the organism whose stimulation tends to result in sexual excitement; the principal ones are naturally quite constant, subsidiary ones may vary. Historically as well as psychologically noteworthy in this regard

is the practice of flagellation; the relationship of the nervous elements involved in the two cases makes the association of flagellantism with sexual stimulation physiologically understandable. It was, not unnaturally, found objectionable as a form of penance. In the present practice, the author draws a sharp distinction between those who submit to flagellation simply as a form of physiological stimulation, and the subjects of the true masochism, which involves the psychic element of subjection and surrender to the person inflicting it. Olfactory stimulation also plays a not unimportant role. Here it is to be noted that some perfumes have only an indirect function, in arousing agreeable associations of various sorts; others are frankly and directly erogenic.

The differentiation from the foregoing of some of the "psychical" sources of stimulation is not always over-clear, especially where they involve sensory stimuli, here visual, or auditory, instead of, as above, tactile, pain, or olfactory. But in respect to sexual imagination the distinction is indisputable. Visual imagination predominates, presumably because it is the more usual ideational type, and the lesser vividness of imagined situations as compared to those of reality is in part offset by their freedom from the limitations of the objective. In a small number of individuals the sexual orgasm itself may be voluntarily induced through purely imaginal means. This is the so-called "psychische Onanie" and is more apt to occur as a sequel to the practice of masturbation. Though rare in the waking state, the author describes it as the normal process in the nocturnal emissions, accompanied by erotic dreams. Under proper physiological conditions, it would seem, however, that these might, with the accompanying dream phase, be induced through entirely fortuitous local stimulation. Idiosyncrasies of sexual reaction may be observed in the dream as well as the waking state (fetichism, sadism, etc.).

As regards the general emotional sphere, it is commonplace that an optimistic and euphoric temper is the more favorable to sexual reactions. The emotion of fear has a peculiarly close association with the sexual mechanism. Although desire is not superficially apparent, paroxysms of *Angst* may bring about ejaculation, also in the dream state.

This brings us to the discussion of the *Sexualtrieb* as such. However much one might incline on theoretical grounds to separate out the *Partialtriebe* of *Fortpflanzungstrieb* and *Begattungstrieb*, under present social conditions the former is pretty completely absorbed in the latter; in women as truly as in men the author is inclined to gravely doubt the existence of a genuine *Schrei nach dem Kinde*. In connection with some discussion of the theories of Moll and Ellis the author defines the essential phases of the *Sexualtrieb* as simply the impulse to the realization of the specific sexual gratifications, and the removal of certain feelings of unpleasantness originating in the same sphere. "Erlangung der spezifisch sexuellen Wollustgefühle und Beseitigung der spezifisch sexuellen Unlustgefühle (bilden) den Kern des Sexualtriebes . . ." (p. 63). The intensity of the sexual impulse as such is not to be absolutely inferred

from the degree of manifested sexual activity, owing to the suppressions imposed by the individual, or on the individual by society; and there is scarcely another topic upon which the opinion of authority is so widely divided. This is seen largely in the discussions of sexual abstinence. Here it is scarcely to be doubted that individual opinion is quite considerably determined by constitution and subjective experience. The French physician Lallemand describes complete sexual abstinence as injurious even to those to whom it is no inconvenience, and most dangerous to those of marked physiological potency; while the medical faculty at Christiania hands down its decision that it was never injurious to anyone. It is difficult, therefore, to generalize on such a matter; the more profitable course is to observe the effect of different conditions upon the intensity of the sexual impulse, and the individual differences that may occasion it. It appears that in men there is an increase up to some 25 or 26 years, and a constancy for some 10 years, followed by an at first gradual and then more rapid decline. Similar intervals obtain in women, subject to the arousal of the impulse through actual sexual experience. Some stress has been laid on the relative inequality of this factor as determining the strength of the impulse in the two sexes; *i. e.*, the difference is not constitutional but psychogenic. The best observations on the point, those of Ellis, point to the conclusion that as in general the sexes are not to be considered as higher or lower, so the sexual instinct in man and woman is not stronger or weaker, but different; in respect to passivity, diffuseness, complexity, periodicity, and the like. It seems, however, that while as extreme limits of intensity are reached in women as in men, it is more frequent at its lower levels in women, and complete anæsthesia is seen more frequently in women of the upper classes.

The question from the racial standpoint is obviously complicated with geographical and climatic factors; the sexual impulse is not only stronger in races of the tropics, but seems to undergo an increase in individuals who settle there from temperate climates. It is, however, a mistake to suppose that the sexual instinct is stronger in savage races. Thus Ellis has demonstrated the existence of far-reaching conventional limitations to sexual activity in uncivilized races that are explicable only on the ground of a more moderate sexual impulse than exists among civilized peoples. The vita sexualis is itself also not without influence upon the development of the instinct, through the adaptation of the organism to imposed conditions. Abstinence diminishes its force, and indulgence tends to make it more coercive. In the physiological sphere one must reckon with the irritability of the nerve centers, the extent of seminal accumulations, and the production and distribution of the libidogenous substances.

In the following section the author treats of the individual differences (a) in the extent of potency; (b) in the power of resistance to injury and abuse. There is some discussion of the physiology of the orgasm, Loewenfeld's own conclusion being that it is the result of specific innervational processes in the centers. It is not dependent upon ejaculation.

Potency would seem to have greater limits in men than ordinarily supposed; some surprising cases in this regard are cited. They need not, however, be always associated with special powers of resistance to sexual traumata. Chief among these are masturbation, and coitus interruptus. There is much individual difference here, also, in susceptibility to their injurious effects. Various disease conditions affect the sexual impulse in special ways; prominent among these is tuberculosis (*phthisicus salax*), which seems, however, to heighten desire rather than potency. The decreased potency in habitual drunkenness is also an important factor in the alcoholic *Eifersuchtswahn*. Brief mention is made of the various neurasthenic disturbances that are the result of excessive or abnormal sexual activity. The principal factor in good sexual power and resistance is constitutional in nature, and depends upon the inherent character of the centers associated with these functions. Weakness in these respects may be either inborn or acquired through abuse; it is generally the latter.

Special considerations are naturally involved in the case of women. The decidedly less orgastic faculty is combined with its greater dependence on selective factors. A few figures are given regarding very large families of children, ranging above twenty, and even over thirty. Native climate appears to have no special influence on fertility, though race is doubtless of some importance; the savage races do not appear more fertile than the civilized ones. In view of the greater diffusion of sexuality among women, it is not incomprehensible that it is more exposed to various traumatic influences.

In the short chapter on secretory functions, the only point that need be noted here is that the nocturnal emissions cannot be regarded as dependent alone upon accumulations in the seminal vessels, but also upon the accumulations of libidogenous substances in the blood, which add to them their stimulating influence upon the nerve centers.

There is space for little more than an enumeration of the different types of constitution that the author evolves out of the factors above described. According to its character in these different respects, the sexual constitution is to be figured as (1) strong or weak; (2) irritable or sluggish; (3) libidinous or frigid; (4) plethoric or ænemic. The characters are thus seen to be determined by distinct features of constitution; potency, lability, desire and trophism, not mutually exclusive. As with most such classifications, it must be understood that the two antitheses are intended simply to indicate the extremes of the character, and not to divide the constitutions into distinct species along their respective lines. The same features may characterize the homosexual or fetichistic as well as the normal impulse. Sadistic-masochistic trends may also form a part of the constitution, though there may be insight into and control of these abnormalities.

As has been indicated above, the more favorable constitutions must be inherited; but as the less favorable types are seen, they appear more frequently as the result of various *noxæ* of the first decades of life. The most important place among these the author assigns to masturbation.

It is frequently supposed that while some history of masturbation is, among males at least, nearly universal, its evil consequences are rather exaggerated by most of those who describe them. Loewenfeld does not regard it as so widely distributed, but productive of actually much more baleful results; the general tone of the contribution lends to this opinion more than ordinary weight. Among his cases, he regards 75 per cent of the disturbances of potency as mainly produced in this way. He therefore urges quite strongly the necessity of careful prophylaxis and proper management. Some writers have also urged the occurrence of a loss of sexual power in males as the result of abstinence. The author does not consider that in normally stable individuals this is likely to have any particular consequences, at least up to the 30th year. It is also possible that many evils are laid at the door of abstinence which are actually the result of masturbation.

The term *Erotik* appears to be used in a sense somewhat different from the ordinary German acceptation, as well as that of its English cognate. In the chapter on *Erotik und Sinnlichkeit* the formula would seem to be *Erotik-Liebe-Sinnlichkeit;* therefore, the elements of love ordinarily regarded as extra-sensuous. Loewenfeld regards the whole process as resolvable into these elements, though it would scarcely seem as though the particular view which the author derives from Westermarck, also quoted by Ribot from Spencer, were to be dismissed so lightly. Phylogenetically the sensuous element would appear much the more fundamental, and it is only in certain cases among the higher apes that we begin to observe sexual processes clearly related to the human love. Nor is it universal in the human race, being apparently absent in a number of lower groups; anthropological evidence being cited in this regard. The entire process is somewhat conditioned by temperament, in the sense that a certain capacity for general emotional response is necessary for its proper development—that it is much influenced in the course of the affective psychoses, is well known. Speaking more precisely, the elements of *Erotik* as distinguished from *Sinnlichkeit*, are feeling of affection for the object (the Sympathiegefühlen of Forel), and the feelings of respect, which may rise to those of homage or worship. Such feelings are evinced in children towards individuals of the opposite sex, being conditioned, despite the absence of sexual development, by internal secretions through their influence upon the nervous centers. Sensuous stimulation is here absent, owing to the lack of development for their centers. In adult life also, there is no particular correlation between the erotic and the sensuous elements of love. And while the sensuous elements are, for physiological reasons, subject to numerous fluctuations, the erotic ones are of more stable character, and the more important part they constitute in a love, the longer it is likely to endure. For the preservation of matrimonial stability entire reliance is not to be placed upon erotic factors alone, indicating that the sensuous element must normally be regarded as essential, even if subordinate.

In discussing the different manifestations of love in the two sexes, special stress is laid on the absence of the true libido in the virgo intacta, to an even greater extent than in the abstinent male. Virginal love takes on its sexual character from the fact that it includes elements of the impulse the stimuli for which originate in the sexual physiology, as much as the true libido, *i. e.*, the impulse towards bodily contact with the object, and the tendency towards manifesting and obtaining the various tendernesses, kisses, embraces, etc. It is much increased in actual sexual experience, but here also shows the great variations to which the author has already drawn attention. The narrower fixation and greater stability of affection in women is discussed, and the opinion is expressed that if there is any social difference, it is rather in favor of the lower social classes.

Mutatis mutandis, the author makes the same generalizations for the homosexual as the heterosexual impulse. In his judgment, homosexuality may be regarded as of an abnormal, but not of a pathological or degenerative origin, and the observations of Näcke are quoted in support. This is another of the points in the general subject where clinical and sociological indications would appear to diverge.

Last, and perhaps greatest in importance, though not in space, the author takes up the question of the sexual impulse as a dynamogenic factor in intellectual life. (Die Libido als Triebkraft im geistigen Leben.) This whole matter is now in considerable need of a critical summary, though the idea is not a novel one, and the review of it includes some quotations from Schopenhauer, Moebius, and Gyurkovechky. The first few pages contain a theoretical formulation of the mechanism to which Freud has given the name of *sublimation*. In sum, there is postulated the libido as a certain condition of excitement in the cortical sex-centers. If this excitement be in any way decreased, libido decreases also; but since the various sources of sexual stimulation yet preserve a certain activity, some excitement may persist in the cortical centers, which may project itself to various purposes, centrally or peripherally. If the reviewer understands correctly, the mechanism of sublimation is supposed to lie very largely, if not essentially, in a sort of *Bahnung*, or projected stimulation, thus effected. To quote, "Die unter die Schwelle des Bewusstseins getretene Libido hört daher nicht auf, einen Faktor im psychischen Haushalte zu bilden; sie besteht als unterbewusstes seelisches Element fort, und die ihr entsprechenden kortikalen Erregungen sind es, die auf das Seelenleben jene mächtigen Wirkungen ausüben, die man der Sexualität überhaupt zuschreibt . . . . Nicht die im Bewusstsein sich vordrängende Libido, d. h. das als solches fühlbare geschlechtliche Verlangen ist es, was die förderlichen Einwirkungen der Sexualität auf unser Seelenleben zu stande bringt. Dieser Einfluss kommt lediglich der in das Unterbewusstsein herabgedrängten oder überhaupt nie in das Bewusstsein gelangten Libido, resp. den ihr entsprechenden zentralen Erregungen zu" (p. 180).

Having formulated this process the author proceeds to submit it to the test of experience. The first observation is that so far as concerns increasing age, no particular intellectual decline was seen which could be brought into association with decreasing libido. On the other hand, a certain *Schüchternheit* or lack of self-confidence appeared to be a common accompaniment. Evidence is then sought in regard to abstinence, *i. e.*, of whether the abstinent, who presumably have more recourse to sublimation, are superior in these respects to those not so.

A near comparison would seem to lie in the Protestant and Roman Catholic clergy of the author's own country. The author does not consider it possible to maintain any special superiority in the latter; indeed a considerable body of opinion would tend to favor the former. And though it is distinctly brought out that the former are selected from a more educated group, it is not thought that this difference should be great enough to offset the effects of sublimation, were this a process of any great importance.

As regards men of distinguished accomplishment in intellectual or artistic fields, it is clear that in a question where one can set Kant against Schopenhauer, Beethoven against Wagner, and Leonardo da Vinci against Rembrandt, not much is to be expected for either side of the case. In general it seems quite impossible to maintain any consistent superiority in the abstinent group.

But there would be a fallacy in arguing simply along these lines, for abstinence may mean lack of libido as well as sublimation of it. Thus the author brings out the principle of organic adaptation as applied to the sexual impulse, which lessens the libido and also its sublimatory effects, as the result of prolonged abstinence. Moderated sexual reactions in no way block the processes of sublimation, and the energy thus diverted to the mental life may be in no way inferior to that in the case of the abstinent. As to the question of whether sublimatory activity tends to be equally distributed along all lines, or to prefer certain specific ones, the author inclines to the latter view, and goes on to enumerate the preferred sorts of expression as artistic, scientific, commercial, industrial, religious, charitable and political—there is surely not much particularization here, but the tendency is to follow specific directions in a given individual. There follows considerable biographical material, mainly of literary figures, the author's conclusions from which also place a minor estimate upon the mechanism under discussion. "We see from the foregoing instances," he says, to render freely, "that the part played by sublimation in poetical creativeness (*dichterische Schaffung*) varies largely in individual cases, and that love itself does not always play the stimulating role ordinarily assigned to it. If, indeed, we wish to proceed with the utmost criticism, we must admit that it is questionable in the case of many poets, whether processes of sublimation have any influence upon their productivity. The same may be considered to hold in other fields of art, and it appears accordingly that the relations of art and sexuality are not so especially important as have been inferred from isolated

prominent instances." Similar opinions are expressed regarding commercial and scientific performances. On the other hand, the effects of sublimation are often seen in the emotional sphere; the theory of antivivisection would appear to stand in close relationship to this mechanism. There is also a concise review of the well-worn topic of sublimation along religious lines, and a paragraph mentioning those of physical activity. Other products of an over-inhibited libido are of strictly pathological nature, as seen in *Angstzustände*, or some of its physiological accompaniments, hallucinatory episodes, etc.

It seems therefore that the more carefully the mechanism of sexual sublimation is examined, the less important and unequivocal the author finds it. Indeed, it is difficult to comprehend how any conception of sublimation referred so largely to the sexual instinct could be uncritically accepted save in the presence of a much hyper-sexualized outlook upon all vital phenomena. The substitution of one series of reactions for another whose outlet is blocked, is a process that occurs between all sorts of human activities, quite independently of the vita sexualis; it is quite conceivable that sexual reactions may themselves be the occasional *Sublimationsprodukte* of activity obstructed in other directions. The nervous system should not be thought of as a laboratory of psychic alchemy, to convert one instinct into another; what takes place is rather the coordination and redistribution of freer energy in those directions most favored by constitution and circumstance.

Here, then, the author has given an insight into the complications of the problem rather than confirmed the original thesis; few will hold this less to the credit of the essay. Agreement is scarcely to be anticipated for every phase of the discussion, and as a whole, the merits of the book far outweigh a few seeming deficiencies which are comparatively unessential. There are works on the topic which might claim superiority on stylistic grounds, but the reviewer has seen none which gives the impression of being more trustworthy. Concrete, systematic and critical, it well deserves the attention of all having an intelligent interest in its subject.

F. L. WELLS.

Reminiscences of Linda Richards, America's First Trained Nurse. (Boston: Whitcomb & Barrows, 1911.)

Aside from a most interesting account of a long and exceedingly successful professional life, this book is in some degree a history of the establishment of training schools for nurses in this country accomplished under many difficulties, not the least of which was the fact that hospitals did not want them and that they were often actively opposed by the medical and surgical staff.

In these early days of the movement, which are really not so far distant, an eight-hour service was unknown. The nurse worked from 5.30 a. m. to 9 p. m. and also took care of her patients by night. There were few demonstrations, the chief instruction being obtained from observation of

the patients, few lectures irregularly given, no class work, no nurses' notes, no written orders—all of which is in marked contrast with the elaborate course of instruction now given in all good schools.

Miss Richards began her work of organizing and reorganizing schools, during which she was connected in an official capacity with twelve different hospitals and one visiting nurses' association, after the most thorough preparation that could be obtained in this country and abroad. Her resident visits in 1877 to the schools of St. Thomas's and King's College Hospitals in London and of the Royal Infirmary in Edinburgh were most unusual but in the early period of the development of nurse training in this country were most valuable and gave her a standing possessed by no other woman of her day.

She was an active participant in two events of the utmost importance to the advancement of the education of nurses; the first was the establishment of the training school of the Boston City Hospital on a plan different from any then existing; the second was the opening of a school for nurses in Kyoto, Japan, under the auspices of the American Board of Foreign Missions.

It would be difficult to over-estimate the importance to the cause of nursing of the departure from the ordinary method in the founding of the Boston City Hospital School. Previous to that time all schools were independent organizations, established and maintained by private benevolence. They had their own boards of directors to whom the superintendents of the schools were immediately responsible and there was opportunity for friction with the administrative department of the hospital. Had the earlier form of organization continued there would be few schools at the present time and these chiefly connected with the larger hospitals, for there is no pecuniary profit in the business of education and there is a limit to private benevolence. It was only when hospitals, appreciating the value of the trained nurse in the care of their patients, entered the educational field that there was opportunity for so many young women to enter a profession, which is for those of moderate general education the best the world affords.

The Boston City Hospital School was the first opened on this basis by Dr. Edward Cowles with Miss Richards as matron and superintendent of nurses. It was a most successful example for other hospitals, which they were not slow to follow. Most hospitals, large and small, now conduct their own schools which not only greatly improve the nursing care of their own patients, but furnish for the public a large number of private nurses. This plan of organization has become practically universal and the original schools have been taken over by the hospitals with which they were associated.

The establishment of a training school for women in Japan was considered a doubtful and startling experiment because of the domestic customs and the position of women in that country. It was accomplished by Miss Richards in '86 and not only introduced a nursing reform, but

was a most important step in lifting the Japanese women out of their old life of complete subservience. It is interesting to note that the reputation of the school was established in the community by the work of nurses sent out into private families and that long before graduation pupils were engaged for service in other hospitals. They now have their red cross organization, their alumnæ association and they rendered valuable service in the Chinese-Japanese War. Work that gives such results certainly was well worth the doing.

With the spirit of the pioneer and a broad view of the nursing field, after many years of work in the training of nurses for the care of patients sick of general bodily diseases, Miss Richards turned her attention to the more difficult work of nursing the insane. She opened a school in the Taunton State Hospital in 1899, in the Worcester State Hospital in 1904, and for nearly three years was superintendent of the school of the Michigan State Hospital at Kalamazoo. It is unusual that one trained in a general hospital can do successful work in a hospital for the insane: that Miss Richards did it is evidence of the breadth of her former experience and of her great capacity for work in new fields.

It is an interesting story, interestingly told and is an example and will be an inspiration to those who follow. It should be read by every nurse.

GEORGE T. TUTTLE.

Index-Catalogue of the Library of the Surgeon General's Office, United States Army. Authors and Subjects. Second Series, Vol. XV. S.—SKIN GRAFTING. (Washington: Government Printing Office, 1910.)

This is a volume of 777 pages, and glancing over them we find much of interest. Under Sitophobia we find 8 articles and one book listed, the latter being published in 1894 by G. Antonini at Bergamo. Cross reference is also made to Fasting: Insane (Feeding of, Forcible), so that the above does not conclude the writings on this subject. From the same page we learn that a Russian in 1907 published a paper on the Physiology and Hygiene of sitting. It would seem that such a paper might be abstracted into a popular form with considerable benefit to a rising generation. The diseases of shoemakers receive attention as well as the toxicology of shoepolish. More than half a page is required to note the articles on shoes. Sex and Sexual require 25 pages to record the literature upon this subject in its many sides, but Sewage and Sewers seem to be of greater importance as they take 36 pages. Many other interesting titles might be noted did space permit. Perusal of the pages of this work is quite as interesting and profitable as reading the dictionary and the Irishman's objection of its being "desultory" is less apparent. The present volume contains 8804 author titles, representing 4688 volumes and 7640 pamphlets. It also contains 3616 subject titles of separate books and pamphlets and 28,328 titles of articles in periodicals. The value of this work to the medical profession is tremendous.

W. R. D.

Manual of Psychiatry. By J. ROGUES DE FURSAC, M. D.; Translated and Edited by A. J. ROSANOFF, M. D. Third American from the Third French Edition Revised and Enlarged. (New York: John Wiley & Sons, 1911.)

The first edition of this work was reviewed in this JOURNAL shortly after its publication and the book has met with favorable reception which was at the time predicted for it.

Since then a second and now a third edition have been found necessary, an indication not only of the worth of the Manual, but of the rapid progress which is taking place in psychiatry.

The author has added to the work sections on disorders of writing; criteria of prognosis in dementia præcox; chronic mania; and acute mental attacks in the feeble-minded. The editor has added sections on race psychopathology; the relation of the Mendelian laws to heredity in insanity; psychotherapy; the constitutional make-ups which determine a special proneness toward dementia præcox and manic-depressive insanity, respectively; new chemical tests for the cerebro-spinal fluid; the pathogenesis of general paresis in the light of recent serological investigations; the kinship between involution melancholia and manic-depressive insanity; the influence of parental alcoholism upon offspring; a measuring scale of intelligence devised by Binet & Simon, etc., etc. The chapter on organic cerebral affections has also been rewritten, with special attention to brain abscess, central neuritis, traumatic psychoses and cerebral arteriosclerosis, and several other changes and additions have been made, notably a description of the technique of the Wasserman reaction.

The author and translator accept the conclusion of Dreyfus that involution melancholia so-called is but a manifestation of manic-depressive insanity, which conclusion appears to have been also accepted by Kraepelin in his introduction to the monograph of Dreyfus. This is a view which the reviewer has always held and taught, having never been able to accept Kraepelin's involution melancholia as a distinct entity.

The work is one which can be readily commended to students and physicians and the translator is to be commended upon the manner in which he has performed his task.

Abstracts and Extracts.

Reports of Three Cases of Mental Derangement associated with Suppurative Otitis media. By Ewing W. Day, M. D. Annuals of Otology, Rhinology and Laryngology, Vol. XX, p. 388, June 1911.

The first case is a woman of 55, who following an otitis media developed a delirious condition during which she was hypomaniacal. The patient was originally greatly run down and developed a mastoid abscess and general streptococcic infection. The author states: "The mental state, it is reasonable to suppose, was brought about by a combination of etiologic factors. These were first and fundamental, the lowered or depressed vital tone which naturally affected the mental operations, together with the double traumata of the operation—for it had both its mental and physical aspects. And then to keep up the mental state, which is initiated by the foregoing causes, we have the toxemia from the infection. So that in this case it would not be correct to say off hand that the otitis media and operation caused the delirium, and yet it can be seen that they had their influence in producing it. But the point for emphasis is that they produced the delirium only because the patient's general condition amply prepared her for it; it was so weakened that it was unable to resist even a slight assault."

The second case was a man of 30 who had a right mastoid operation and after his discharge from the hospital developed headaches and optic neuritis. A diagnosis of abscess was made but at operation the brain and dura showed no pathological changes. The patient showed depression at this time and later developed mutism, delusions, apathy, etc., and was diagnosed dementia præcox. The conclusion is reached that while the operation was probably the precipitating cause of the mental trouble, the general make up of the patient was directly reponsible.

The third case was a stolid man of 52, who in March had an otitis media following grip. This was followed by severe headaches increasing in severity, and by October he could only sleep when given opiates. Irritability and a hallucination developed and he had to be watched for fear of suicide. A mastoidectomy was done October 20th and the sinus was found to contain a well organized clot extending from half way to the torcular to the jugular bulb. The interesting clinical feature of the case, was the absence of all the clinical symptoms of thrombosis, with the exception of the infrequent one of pain, and pain of such severity that the patient's mental condition was questioned. W. R. D.

A Preliminary Note on the Categories of Association Reactions. By FREDERICK LYMAN WELLS. The Psychological Review, Vol. XVIII, p. 229, July, 1911.

In this brief paper Wells advocates that the classification of reactions obtained by the association test be simplified to include but five categories which are broader than those that have been hitherto proposed and which include all of the classes formerly used. In a table it is shown how the older and the present classification telescope each other.

The categories as proposed by Wells are, first, the egocentric, and includes: a. Reactions of modification; b. Reactions in which the response is a proper name; c. Reactions in which the stimulus word is interpreted as a proper name; d. Reactions in which the response involves a pronoun; e. Failures of response or repetitions of the stimulus word. It is probable that this category should also include associations where coherence is exceptionally vague.

The second category is the supraordinate which is confined to the individual-genus order.

Third is the contrast group.

Fourth, the miscellaneous group including reactions of doubtful assignment.

Fifth, the speech-habits group.

The author believes that this system of treating the data will, in the simplest way, show the important things about an associational tendency that the quasi-logical method is capable of showing. Its main weakness lies in the insufficient definition of the more highly egocentric responses. Statistical analysis, where possible, is the only method of dealing with such cases as individual observations; but they do not appear sufficiently important to distort or even obscure the basal trends of association—reaction through fairly extensive series of observations. W. R. D.

Obituary.

BIOGRAPHICAL SKETCH OF I. W. BLACKBURN, M. D., WASHINGTON, D. C.

Isaac Wright Blackburn, M. D., was born in Bedford County, Pa., May 27, 1851. His father was Abraham Moore Blackburn, and his mother's maiden name was Barbara Harris Wright. The families were of English descent originally, but emigrated to this country during the 17th Century, and are, therefore American. The families were among the early settlers of Pennsylvania, and were of Quaker stock, and many of their descendants yet continue in the faith of the Society of Friends.

I. W. Blackburn received his early education in the public schools, supplemented by private instruction. In 1872 he took up the study of painting, hoping to become a portrait painter, and with this in view, became a pupil of Prof. C. Schussele, principal of the Pennsylvania Academy of Fine Arts, Philadelphia, in his private art school. Subsequently he became a student at the academy under Schussele, Eakins, and Bailey. While pursuing his art studies at the academy he attended the lectures and demonstrations of Prof. W. W. Keen, on artistic anatomy, and becoming deeply interested in the study of anatomy, decided to study medicine. As a preparation for the study of medicine he entered the office of a preceptor, S. F. Lytle, M. D., of Philadelphia, Pa., and remained under his instruction while preparing to enter the University of Pa. This course of study, and a course in scientific study in the Auxiliary Department of Medicine in the University of Pa., prepared him to enter the Medical School of the University, in 1879. In 1882 he graduated with honors and received the Morbid Anatomy Prize offered by Prof. Tyson, for his thesis on the "Microscopic Diagnosis of Lymphoid Structures." Deciding to adopt the branch of pathology as his life work in medicine, he remained two years for a post-graduate course in pathology under Dr. Henry F. Formad, Demonstrator of Pathology in the University of Pennsylvania.

On July 1, 1884, he was appointed Special Pathologist to the Government Hospital for the Insane, Washington, D. C. In 1885 he was appointed to the position of lecturer on the Pathology of Mental Diseases, in the Medical School of the Georgetown University, and in 1886 was given the Chair of Pathology. In 1889 the laboratory work and lectures on Histology were given in charge of Dr. Blackburn, together with the Chair of Pathology. In 1898, owing to increased work, the Chair was divided, and Dr. Blackburn was elected Professor of Morbid Anatomy and Special Pathology, which position in the school he occupied at the time of his death. In 1906 he was given the Chair of Morbid Anatomy in the Medical Department of the George Washington University, of Washington, D. C.

Dr. Blackburn was a member of the American Medico-Psychological Association; American Association for the Advancement of Science; Philadelphia Pathological Society; and other Medical and Scientific Societies.

A list of Dr. Blackburn's publications, which is known to be incomplete, is appended, and though it comprises twenty-two captions, in which are included three books, it gives but a very faint idea of the amount of work and the activity displayed by Dr. Blackburn during his life. At the time of his death he had performed considerably over two thousand autopsies, each one of which had been recorded with scrupulous care and furnished material always valuable for reference. He had accumulated an immense amount of this material, a great deal of which he had studied over and had made extensive notes on, so that it might have been published had he lived. In this position, however, the Doctor was so modest and retiring that a great deal of his most excellent work never saw the press for that very reason.

Although Dr. Blackburn specialized in the gross pathology of the brain, he was unusually well-grounded in general pathology, and I think it would be said by anybody acquainted with his work that he stood in the front rank of pathologists in this country, and that there were few, if any, who were his peers in the matter of the gross pathology of the human brain.

His death is a distinct loss to the field in which he worked, and to the Government Hospital for the Insane in particular.

The following is a partial list of the publications of I. W. Blackburn, M. D.:

NOTE.—This list is known to be incomplete, as it has been impossible to find references to some of Dr. Blackburn's work prior to 1902.

1. Pathological studies (on paresis, pachymeningitis, arteriosclerosis, epilepsy, etc.) in the reports of the Government Hospital for the Insane, 1884-1902.
2. Manual of autopsies. 1902. Philadelphia, Blakiston's. 84 pp.
3. Intracranial tumors among the insane. 1902. Govt. Print. Office. 95 pp.
4. Gross morbid anatomy of the brain. 1908. Govt. Print. Office. 156 pp.
5. Special edition of 74 plates, illustrating the histology of tumors, from a projected manual of microscopic diagnosis (in collaboration with Formad). The work was never finished and published as a whole owing to the death of Dr. Formad.
6. Method of preparing brains and other organs for anatomical and pathological demonstration. Trans. 9th Intern. Med. Cong., Vol. 3, 1887, 407-409.
7. A case of chronic hydrocephalous. Jour. Amer. Med. Assn. 1888. Vol. 10, 159-161.
8. Sarcoma of the suprarenal capsules. Jour. Amer. Med. Assn. 1888. Vol. 10, 389-391.
9. Method of preparing brains and other organs for anatomical and pathological study. Jour. Nerv. and Ment. Dis., 1889, Vol. 14, 113-114.
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W. A. WHITE.

Half-Yearly Summary.

ALABAMA.—*Alabama State Hospital, Tuscaloosa.*—The residence of the superintendent, Dr. James T. Searcy, was destroyed by fire, March 5, 1911.

ARKANSAS.—It is reported that the construction of a new hospital was authorized by the State Senate on May 2, 1911. It is to cost $200,000 and will be erected on a tract of land of 500 acres.

ARIZONA.—*Territorial Asylum for the Insane, Phoenix.*—On the fifth of September, 1911, fire destroyed a great portion of the main building, more particularly the administration part and the East Wing. At an early date between $80,000 and $100,000 will be available for building purposes and a better and fire-proof accomodation will be provided. Many other improvements are contemplated.

CALIFORNIA.—*Napa State Hospital, Napa.*—The additional wing of the receiving and treatment building has been completed and will be occupied by male patients.

Dr. Matthews recently appointed first assistant, has been placed in charge of the medical staff of the institution, and is formulating plans for the adoption of the Meyer system of examination, both mental and physical.

Considerable work is being done in carrying out the provisions of the law passed by the legislature regarding the sterilization of patients.

—*Mendocino State Hospital, Talmage.*—During the past six months four wells have been bored for water for irrigation. Two of these, near the hospital are flowing wells with a depth of 80 and 170 feet, the diameter being 12 inches. The other two are at the hospital ranch and are also 12 inches in diameter but are not so deep, one being 60 and the other 80 feet. The flow is 1000 gallons per minute and the water is used principally to irrigate alfalfa. A dam is being built across the canyon to form a reservoir for water which it is estimated will hold from 15 to 20 million gallons and is situated at an altitude of 250 feet above the hospital.

Money is available to build a cottage for an assistant physician which will probably be begun in the near future.

In 1912 money will be available to build a cottage for 50 patients at the ranch which it is expected will cost about $25,000. This will probably be built next summer.

COLORADO.—*Colorado State Insane Asylum, Pueblo.*—The grounds of this hospital are to be enlarged by the purchase of four blocks of town lots adjoining its east line. Condemnation proceedings are now under way and the money is appropriated for the purchase. When improvements have been made to the land purchased it will add much to the appearance of the whole tract.

CONNECTICUT.—*Hartford Retreat, Hartford.*—There is now under construction a home to accommodate 25 nurses, which is made possible by the gift of $11,000 by the husband of a former patient who intends it to be a memorial to her.

Considerable work has been done in renovating the heating plant. Shaking grates have been installed under the two boilers permitting the use of a cheaper grade of coal. The steam pipes to Barnard Cottage and the Superintendent's house have been relaid in glazed tile with the result of successfully insulating them. Several hundred feet of supply and return pipe have been replaced, and iron boxes with asbestos lining have been used as far as possible in place of wood boxes around the stacks. The use of low pressure, by Mason regulators, in radiators at distant points is now possible, where formerly only the high pressure was effective.

The fourth and fifth halls of the south wing have been greatly improved by the removal of a stairway on the south wall, making it possible to put in two windows on the first floor and three on the second. The sitting rooms are much brighter and the outlook is enlarged. Adjoining the sitting room created on the first floor by the removal of partitions, a pleasant suite has been made by cutting out a dividing wall between rooms formerly used for disturbed cases. This not only has added a needed suite, but has benefited the ward.

ILLINOIS.—The last legislature appropriated $1,500,000 for the establishment of a new state hospital for the insane. Seventy-one sites have been offered and the State Board of Administration has planned a trip in order to inspect them.

—*Cook County Insane Hospital, Dunning.*—A fire at this institution on August 27 necessitated the removal of about 200 patients, which was accomplished without casualty by Drs. Eberlein, Smith, and Rea, who with the nurses were commended by the president of the county board. The fire caused a loss of about $5000.

—*Elgin State Hospital, Elgin.*—Seven attendants of this hospital were suspended because they had planned to strike on August 29, their grievance being that they were not allowed off one day each week.

—*Anna State Hospital, Anna.*—During the past few months the industrial departments have been over active in the matter of construction. Two new silos of re-inforced concrete have been completed. The smaller

one of the two has a capacity of 2916 cubic feet. The large one 3402 cubic feet.

These silos are rapidly being filled, thus giving 400 tons more feed for the herd this winter than last. The herd consists of 121 high grade Holstein-Friesian cows. Recently four heifers and one young bull, all registered, have been added. This institution furnishes its own milk.

The addition to the store room is nearing completion. Within a short time, all teaming can be abolished. All supplies will be unloaded from the cars at the store house.

The state architect will soon ask for bids on a new kitchen and bakery. The chief engineer has about completed a new distributing tower for electric light wire and power conductors.

In the medical department, no changes have taken place. Daily staff meetings with presentation of each case takes place. Practically no mechanical restraint has been used in this institution.

—*Peoria State Hospital, Peoria.*—The "Peoria State Hospital" has been the official title of this institution since 1909, supplanting the former name, "Illinois General Hospital for the Insane," which in turn supplanted the "Illinois Asylum for the Incurable Insane."

To meet the demands of a modern receiving hospital of a capacity of 2100 patients, a high class receiving cottage was built with a capacity of fifty beds. Its construction and equipment are all that the most enthusiastic psychiatrist could wish for.

It consists of but one story and has an octagonal solarium as well as a glass porch. The hydrotherapeutic arrangement is very complete and is in the hands of a nurse specially trained for that purpose. There are many private rooms, several dormitories and a very commodious day or sitting room.

A cottage for fifty male patients has been similarly equipped and a receiving service of about 400 patients annually is thus amply provided for.

During the past year a congregate dining room seating 700 patients has been completed and occupied. It is octagonal in form and of a diameter of 100 feet in every direction. The food is conveyed from the general kitchen by patients with small four-wheeled covered wagons and is always hot. Two domestics with the aid of fifty patients spread the meal quickly and just as the last course is placed upon the tables the patients arrive. There is no signal—no whistle, gong or sound—but the entire transaction is so accurately timed that when the 700 patients arrive from twelve detached cottages the meal is ready.

It has been gratifying to note the improvement in the table manners of the patients. The room is well lighted and half an hour is spent at the tables. Every patient has knife, fork and spoon; cup, plate and saucer, tumbler and side-dish. There has never been an escape or runaway on the way to and from the meals and the compulsory walk from the cottages to the mess hall has had a beneficial effect upon the patients.

The recent legislature voted liberal sums both for the maintenance and the improvement of the institution. A forty thousand dollar dormitory for male employees, a thirty thousand dollar building to house the farm colony, and a ten thousand dollar dairy are among the new buildings allowed.

An independent water system will be installed and steam will take the place of water for heating purposes. The cost for these changes will be nearly one hundred thousand dollars.

Pellagra, of which there were 200 cases in 1909, and 100 recurrences in 1910, has appeared very lightly this year. A significant development of the year is the fact that several patients recently received showed undisputed evidence of the disease on admission. The disease is also being recognized throughout the state occasionally. The Illinois Pellagra Commission is about to publish an exhaustive report of its investigation.

A clinical staff meeting is held daily at 8 A. M. and a business session at 1 P. M.

Dr. H. Douglas Singer, Director of the State Psychopathic Institute is a frequent visitor and his review of the work and discussion of cases is always a matter of interest.

—*Kankakee State Hospital, Hospital.*—The new one story cottage recently completed, represents a departure in the architecture heretofore pursued in Illinois. It is built of stone finished substantially with terrazzo floors in the corridors, dining room, and laboratories and hard maple floors in the two dormitories and day rooms. This cottage will accommodate seventy patients and is designed for custodial care of terminal dements. A court in the rear provides for out-door care and adds to the architectural effect of the building. The bathing facilities and clothes room are in the basement. Kitchen facilities are in the adjoining farm cottage, the new cottage being reached by a tunnel which also provides for steam, water, and light carriage.

Among the new appropriations for this hospital for the biennial period are provision to reconstruct a cottage into a nurses' home; the building of a warehouse for the storage of supplies, and a new roof over the boiler house and coal storage-room.

Dr. H. Douglas Singer, Director of the Psychopathic Institute which is located at this hospital, has completed the organization of his staff as follows: Dr. Albert H. Dollear, Psychiatrist; Dr. L. J. Pollock, Pathologist, both being transferred from the Watertown State Hospital; Dr. William H. Holmes, late of the State Board of Health Laboratory, Bacteriologist; Mr. A. F. Wassau, from the State University, Chemist. Active clinical and research work is being carried on in the Institute.

Iowa.—*Cherokee State Hospital, Cherokee.*—The institution has just completed two silos joined with a vestibule connection of the same material. The dimensions of each silo are as follows: 20 ft. diameter, 40 ft. high. The silos and vestibule have been erected with vitrified hollow brick blocks

of the following dimensions: 5 x 8 x 12. The material for the roofs and doors is concrete reinforced with steel. Contract has just been let for a two story laundry annex, and also for the installation of two additional Sterling boilers in the power house, each boiler with a rating of 207 horse power. Contract is also soon to be let for a Cochrane hot water heater. Contract has been let for enclosing all of the porches on the psychopathic hospital, all second story porches to be enclosed with fly screens as well as strengthening screens, while the porches on the first story will be enclosed with fly screens alone.

—*Iowa Institution for Feeble-Minded Children, Glenwood.*—This institution has a population of 1300. The educational staff consists of twenty teachers. There is a hospital with 60 beds, the staff of which consists of a matron, head nurse and eight pupil nurses, there being an accredited training school in connection with the hospital.

A laundry building is now in course of construction which will cost $25,000.

Additions are also being made to the water system.

A contemplated improvement is the erection of a new fire-proof cottage for girls to accommodate 250.

KANSAS.—*State School for Feeble-Minded, Winfield.*—This institution suffered the loss of its main dormitory by fire the night of July 24, 1911. The fire started about 11 P. M. and all of the patients were marched out of the grounds. Early in the morning, after the fire had been extinguished many were taken back to their sleeping quarters, but about half were obliged to sleep upon the ground on a hillside near the institution. There was no loss of life and no one was injured.

KENTUCKY.—*Central Kentucky Asylum for the Insane, Lakeland.*—There is now being erected a tuberculosis hospital which will accommodate 24 patients. It is constructed of wood after the most approved plans.

A training school for nurses will be inaugurated October first.

During the past year a library has been established for the use of the patients, and moving picture apparatus was purchased in order that frequent shows might be given for their amusement.

A water line from Louisville is now under construction and an elevated tank with a pumping station will be installed at the hospital.

Non-restraint of patients has been a feature of this institution for the past two years and the use of restraint has been almost entirely discontinued.

The next legislature will be asked for an increased per capita allowance, and for the establishment of hospitals and psychopathic departments at each of the state institutions.

MARYLAND.—The Maryland Psychiatric Society has issued a periodical under the name of the Maryland Psychiatric Quarterly which contains an

account of its proceedings and the papers read before it, as well as news of psychiatric interest. The society has now been in existence for three years and during that time has done much to advance the interests of the insane. The movement for the adoption of state care owed considerable of its success to the members of this society and the society has recently employed a play-ground teacher to visit the City Detention Hospital at Bay View and instruct the patients and nurses in various athletic games and in some of the simpler forms of handicraft as means of reeducation. Subscriptions are also being solicited for a fund for the employment of a physician who shall have charge of after-care work and it is believed that such a fund will be raised. The society's object is to give a practical demonstration of both of these methods of treatment with the expectation that they will later be supported by state appropriations.

—*Maryland Hospital for the Insane, Catonsville.*—There is under construction a new kitchen, measuring 72 by 60 feet and one story in height, which will be thoroughly fire-proof with tile flooring, glazed tile walls, and all the cooking apparatus of copper or other metal. Cooking will be done with gas. In connection with this building a cold-storage plant is being installed.

An addition is also being constructed to the female department, measuring 115 by 46 feet having three stories and a basement. The last will be used as an industrial shop for the women, the first and second floors as dormitories for the women patients, and the third floor as sleeping quarters for the nurses. The building will accommodate about 150 patients and 40 nurses. It is of concrete construction throughout with concrete flooring, the walls being finished with brick inside. There will be a fire-escape on the end which will be used as a porch in summer.

—*Mount Hope Retreat.*—A large addition is being made to this hospital, consisting of two additional wings, two stories high, and a number of other improvements, the cost of these being $90,000.

—*Sylvan Retreat, Cumberland.*—This institution which has been hitherto a county asylum, will be made a state hospital for the Western District of Maryland, including Washington, Allegany and Garrett counties. It will be placed in charge of a medical superintendent. At present there are 102 patients, 53 of whom are women. It is intended to introduce industrial occupations and eventually to enlarge the hospital.

MICHIGAN.—*State Hospital for Insane Criminals, Ionia.*—Fire on July 5, 1911, destroyed the dining room and kitchen causing a loss of $50,000. There were no casualties.

MISSOURI.—*State Hospital No. 3, Nevada.*—A steam heating plant is now being installed in the institution at a cost of nearly $30,000 which will be completed about October 15. All patients of the hospital are given a thorough physical and mental examination on admission and placed on

such treatment as is required. Staff meetings are held regular on Monday, Wednesday and Friday of each week for the consideration of all cases admitted.

A contract for the industrial building which was destroyed by fire in June, 1911, has been let and the work of rebuilding the same will be commenced very soon.

MISSISSIPPI.—*Mississippi Hospital for the Insane, Jackson.*—Recently a fire occured in the negro wards which did not cause serious damage. During the fire a number of the patients escaped but were later returned to the institution.

NEBRASKA.—*Nebraska State Hospital, Ingleside.*—A new building with one hundred beds for the care of convalescent insane has been completed within the past two months and is now in use, giving the institution at the present time a capacity of 1300 beds.

NEW JERSEY.—*New Jeresy State Hospital at Trenton.*—At the last session of the legislature, $103,000 was appropriated for extraordinary improvements, among which are the following: A complete dental outfit has been installed, and a dentist appointed who will spend two afternoons a week looking after the patients' teeth.

$970 has been appropriated for a fire-proof steel-filing cabinet which has been installed for use in the medical department for filing the records.

$2000 was appropriated for new furniture for the wards, and the mission furniture purchased with this money has added materially to the appearance of the hospital.

The following equipment has been purchased for the laboratory:

Leitz Photomicrographic Outfit.
Fulmer and Schwing's Microscopic Camera, with Laboratory Stand.
Board of Health Type of Incubator.
Eclipse Autoclave.
High-Power Large Capacity Centrifuge.
Bausch and Lomb Microscope.
Convertible Projection Apparatus, Bausch and Lomb.
Jung Microtome.
Leitz Dark Field Outfit.
Rotary Autopsy Table.
Special Incubator for Wassermann Reaction Work.

The old building on the grounds, known as the museum, which was donated to the state by Governor Randolph in 1854, has been remodeled into a recreation hall for attendants and nurses.

The sum of $2800 was appropriated to carry on special investigations by two field workers. Two trained workers supplied by Dr. Davenport, Secretary of the Eugenics Section of the American Breeders' Association at Cold Spring Harbor, Long Island, have been employed. Their work is twofold. They visit the families of new patients, and get information

regarding heredity, habits and disposition of the patients, environment, domestic relations, etc. This information makes valuable addition to the medical history. In one instance, the field worker investigated two thousand members of the family of one patient and the direct connections. Thirty members of this family had been patients in this hospital. The second part of their work, which is equally important, is the "'after-care" work. The field workers visit discharged patients at certain intervals, and investigate their condition, and report to the hospital anything unusual which would have any bearing on the recurrence of mental trouble. These catanamneses furnish valuable data in regard to the recovery and condition of discharged patients, as well as being of considerable assistance to the patients themselves.

Money was appropriated for the purchase of two farms. This will add 250 acres of farm land to the hospital.

A new laundry has been erected, and equipped with modern machinery, at a cost of $30,000.

A tuberculosis shack has been erected for female patients, and will be occupied in a few weeks.

At a cost of $3000, a complete hydrotherapeutic outfit for male and female patients has been installed.

—*New Jersey State Hospital at Morris Plains.*—On May 1, 1911, the board of managers rearranged the staff and appointed Dr. E. Moore Fisher, formerly Second Assistant Physician, and Dr. L. K. Henschel, formerly Third Assistant Physician and Pathologist, Senior Assistants; the other physicians taking the rank of Junior Assistants.

The last legislature appropriated sufficient money for the addition of two more assistant physicians to the medical staff.

The overcrowded condition of the hospital has become so marked that the daily papers have taken cognizance of the condition and have placed the matter clearly before the public.

The legislature at its last session appropriated $40,000 for the erection of a Male Nurses' Home, which will enable the rooms now occupied by the attendants to be used for patients. The contract for the home was awarded at the meeting of the board of managers, held September 14.

The work on the new kitchen at the main building is slowly progressing.

The last legislature also appropriated $15,000 for the erection of a new fire house, which will contain the fire equipment and will provide stabling quarters for two horses and sleeping room for twenty male employes. The added room and new arrangements are necessary, as the growth of the buildings connected with the institution has made the service heretofore provided insufficient and antiquated.

A dental parlor has been arranged for, and the consulting dentist will, in the near future, hold regular clinics at the hospital.

The quarters of the assistant physicians have been renovated.

There was a fire in the female wing of the dormitory building on July 21, 1911, which started in a cupola, following a severe electrical storm.

The hospital fire department soon got the fire under control. As the fire started while the patients were at dinner in the congregate dining room, they were but slightly disturbed. No one was injured and the damage was slight.

It is proposed to change the length of the course in the Training School for Nurses, making it three years instead of two. One male and eleven female nurses graduated in June, 1911.

A new cement walk has been laid from the front of the main building to the trolley station, and work has been started on a cement walk from the termination of the flag-stones in front of the main building to the entrance of the grounds.

An appropriation was allowed for the installation of a new dynamo, and the contract was given out on September 14.

Following an appropriation of $8000, a contract was awarded for screening the ward windows of both buildings, and the work is to be finished before next summer.

There was also $10,000 appropriated for a pavilion for the tubercular insane, who up to this time have not been segregated but have been isolated as much as possible in rooms throughout the wards.

The honorable Woodrow Wilson, Governor of the State of New Jersey, paid a visit of inspection on August 29, 1911.

During the past summer, the medical director obtained from the board of managers permission for the male and female patients to use half an acre of ground each, in different parts of the premises, for gardens. This proved very satisfactory and has been the means of giving many patients light out-door occupation and at the same time helps to keep the wards supplied with more fresh vegetables and flowers than formerly.

—*New Jersey Village for Epileptics, Skillman.*—Work has been begun on a building for feeble-minded men which will cost $37,810.

An exhibition of the work done by patients was held at Newark, June 3, and the village was open to the public for inspection.

New York.—The Board of Inebriety was formed July 11, 1911, when the Mayor appointed seven gentlemen to serve as members, two of them being physicians, Dr. William G. Browning, of Brooklyn, and Dr. John Dorning, of New York. All male persons arrested for intoxication will be reported to this board by the police after October 1. It has been decided to acquire land within 35 miles of New York for the erection of three hospital buildings, the cost of the site and buildings to be about $550,000. A bill has been signed by the Governor authorizing the establishment of inebriate hospitals and colonies by cities of the first and second class. These to be under the charge of the Board of Inebriety consisting of seven members who serve without compensation. Numerous changes are made in the penal code in regard to intoxication, the principal one being to put inebriates under the supervision of the Board of Inebriety.

—*Binghamton State Hospital, Binghamton.*—Several changes have occurred in the medical staff of this hospital during the past year which have made such serious inroads of the working force of the medical staff that the State Commission in Lunacy consented to the immediate establishment of two additional positions in the grade of second assistant physician. Appointments to these positions being noted under Appointments, Resignations, etc.

Some noteworthy improvements are being made at this hospital. A new filter plant, which has long been needed, will soon be completed and it is expected that the water supply, which has hitherto been regarded as so unsafe that for several years practically all of the water used for drinking purposes has been boiled, will be suitable for such use without sterilization. Extensive improvements to the refrigeration plant are about completed so that the hospital's resources in this direction will be enlarged to a considerable extent; renewal of the main steam lines and of the entire heating system of the main building has been made during the past summer.

Fire escapes on the Nurses' Home are being erected, many doors to the exits which heretofore have opened inward, are being changed so as to open outward to avoid jamming in case of a fire panic. Extensive additions to the general fire equipment are being made, including a combination chemical and hose-cart to be drawn by a horse.

A new system of nightwatch recording clocks is being arranged for, and extensive improvements to the telephone system are under way.

On September 1, 1911, Mrs. Mary J. Vreeland began her duties as superintendent of the training school for nurses, and arrangements have been completed for a special course of instruction to nurses and attendants, in the use of hydrotherapy, as treatment for the insane, by Dr. Rebekah B. Wright, who, for a number of years past has given special study to this branch of therapeutics.

—*Manhattan State Hospital, Wards Island.*—Following is a list of improvements made since the issue of the last half-yearly summary:

The medical quarters, plumbing, heating and lighting connection of the four cottages mentioned in report of March 14, are now completed.

The construction of the kitchen building for the four cottages is about completed.

The wards of the old and new branches have been painted and Wards 23, 25, 26, 28, 29 and 30 are being painted.

The new high pressure steam return line and changes in low pressure return line under the new buildings are nearly completed.

Repairs to the extent of $6000 have been made to roofs, leaders and gutters of Wards 17 and 21, Main Building Center, East Building Boiler, Staff House and Annex.

Work is now under way on an extension to the electric light plant, changing the present generator and building foundation for new generator.

During the past six months there has been only one case of diphtheria and that affected one of the assistant physicians. There is, however, one patient who had diphtheria more than a year ago and who is still a carrier of the diphtheria bacillus. In all other respects she is quite healthy. Her condition has necessitated her isolation and she is cared for by one attendant day and night.

Fifteen members of the Training School, thirteen women and two men, were graduated this year.

The Immigration Department and the Board of Alienists of the State of New York have been active in deporting insane aliens. A large number has been received during the year and every few days some one is taken to the steamer for deportation.

—*Utica State Hospital, Utica.*—The new laundry building, recently completed, has been equipped throughout with new machinery, and has been in active operation since May 22, 1911.

For a number of years efforts have been made by the city to extend a street (Hickory Street) across the hospital property. Up to this year these efforts have not been successful, but during the past session of the Legislature a bill authorizing the extension of the street became a law. This, and the fact that the population of the City of Utica has increased rapidly and has encroached upon the privacy of the hospital and interfered with the management of the patients has led to the suggestion on the part of Governor Dix, that a new hospital be erected in the vicinity of Utica. A law authorizing the Commission in Lunacy to enter into a contract for the purchase of a suitable site was passed by the legislature and approved by the governor. A number of sites have been under consideration by the Commission in Lunacy and the Members of the Board of Managers, and it is expected that about a thousand acres of land will be secured and a hospital erected to accommodate between 2000 and 3000 patients.

—*Hudson River State Hospital, Poughkeepsie.*—Plans for extending the structural equipment of the hospital include an addition to Inwood, the group for chronic patients, which will accommodate 40 disturbed male patients. The large percentage of single rooms which this addition will contain (80 per cent) will make easier the task of caring for this class.

The Reception Hospital has never completely fulfilled the needs of this institution. The plan of building an extension to the rear from each side which has been adopted will give accommodations for 14 patients, with the desirable feature of completely separating the disturbed cases from the quiet, and will permit violently excited patients to be retained in a building most suited to their needs without being a source of annoyance to the quiet, newly admitted patients. The continuous bath tubs will be moved from their present location in the Reception Hospital to the immediate vicinity of the disturbed patients. This addition will accommodate in the basement a recreation room for the women and smoking-room for the

men. Outside sleeping quarters are being considered, either on the roof in the form of a roof-garden or on the porches, the practice of caring for physically reduced and sick patients in the open air having been found beneficial.

Fire protection has occupied an unusually important place. Additional fire escapes are to be constructed; water pressure tests have been made together with the extension of water mains and the services of an experienced exempt fireman from the New York fire department secured. Additional fire houses are to be built and two automatic whistle blowers will be installed in the near future.

Miss Margaret Glancy, a graduate of this hospital, and of Bellevue, was appointed Superintendent of the Training School.

An inter-hospital conference was held in this hospital in June 1911. Pathological material collected during the past year and cerebral syphilis were prominent among the topics discussed.

—*Willard State Hospital, Willard.*—Since the last summary was submitted four cases of typhoid fever have occurred; three patients came down with it during the month of March last, and one employee during the present month (August).

A tragedy was enacted at the electric light plant on the morning of May 28, when a young man named Thomas Carroll, employed as a lineman in the electrical department, was killed by a patient named Charles Conklin. It was Sunday, and Carroll was the only employee on duty at the time, his work being to attend to the boilers and a pump connected with the reservoir; he was one of four who took turn in performing Sunday duty at this department. The patient Conklin had been a helper in the boiler room for several years. On this particular morning Carroll was seen by another employee at eleven o'clock, sitting in a chair outside of the boiler house door, with his back toward the door; the patient sitting on a wheelbarrow near him. Half an hour later Carroll was found dead on the boilerhouse floor immediately in front of the boilers, with several extensive scalp wounds on the back part of the head and a badly fractured skull, which had evidently been done with a miner's pick used for breaking coal, and found nearby besmeared with blood and hair. The patient, who is very much demented, would give no account of the affair, but admitted having done the deed, and the circumstances indicated that the first blow was struck while Carroll sat in the chair outside, in front of which was a small pool of blood. From this point to where Carroll's body was found blood-drops were clearly traceable. When interrogated as to why he had killed Carroll, the patient replied that he was throwing asbestos in his eyes to blind him. Conklin was subsequently indicted by the Grand Jury for manslaughter and committed to the Matteawan State Hospital for insane criminals.

Appropriations of $45,000 for a filtration plant and sewage disposal, and $7000 for a new barn have been made.

—*The Craig Colony for Epileptics, Sonyea.*—Chapter 588, laws of 1911 gives certain custodial power over practically all patients to be admitted in the future. There is a section providing for the voluntary admission of these mentally competent to make a proper application; for the granting of a parole not to exceed forty-five days; and for securing, when indicated, the commitment after admission of those admitted under previous laws.

It is hoped that this law with similar ones for the Rome State Custodial Asylum and Letchworth Village will ultimately lead to a general enactment providing for the judicial commitment of all those mentally defective whether feeble-minded, epileptic, or what not.

A contract has been awarded for the construction of a modern two story brick dormitory building for sixty male patients. The structure is to cost about $40,000 and is to replace Six Nations, an old Shaker frame building, erected some sixty years ago.

A contract has also been awarded for rearranging the sewage disposal plant. The three large beds are to be subdivided into twelve smaller ones and settling and dosing tanks installed.

Equipment for the making of vitrified paving brick is about to be installed at the Colony brickyard.

An appropriation of $25,000 for a Central School Building has just been received. It is intended to have the sewing room, sloyd school, and possibly a domestic science room in the new building, in addition to rooms for the ordinary school work.

An appropriation has also been received for the construction of four additional small cottages for married employees.

Owing to lack of appropriations, Letchworth Village continues to be unable to relieve the Craig Colony in any way.

The position of Superintendent of Nurses at a salary of $1200 per annum and maintenance has been created. It is hoped that this will be a step toward readjusting the Colony Training School for Nurses so as to meet all requirements of the State Education Department for registration.

A resident dentist and a bandmaster have also been allowed.

The lack of proper quarters for the employees in direct charge of patients is more evident.

The census on September 4, 1911, was males 759, females 656, total 1415.

—*Long Island State Hospital, Brooklyn.*—The repairs to the main building which began last winter have progressed steadily. The plans provided for steel ceilings, rewiring of the entire building, new plumbing and substituting fireproof stairways for the old wooden stairways which were formerly in use. The condition of the hospital property preceeding the beginning of these repairs was such as to be dangerous to the patients and employees, and the work now going on merely serves to make the building safer and more sanitary. Much more work will have to be done in various lines be-

fore the present building can be considered adequate for the care and treatment of the insane, according to modern standards.

An out-patient department was opened early in July. This is the second out-patient department in connection with the New York State Hospitals, the first one being at the St. Lawrence State Hospital, Ogdensburg. The situation of this institution, near the center of Greater New York, is such as to justify the belief that many persons will avail themselves of the opportunity to secure advice and treatment in connection with a clinic of this kind. The experience since the out-patient department was opened has justified the expectations in this respect.

—*Gowanda State Hospital, Gowanda.*—In October there will be erected a small building of wood and glass which will accommodate about 18 male tuberculous patients.

—*Rochester State Hospital.*—A sterilizing plant for all articles that have become infected is being installed, and a small hospital for contagious and infectious diseases is provided.

—*Buffalo State Hospital, Buffalo.*—By Act of the Legislature of 1911, there was granted to this hospital the sum of four thousand dollars for the construction of a frame building for the reception of patients with contagious diseases. A building of the bungalow type of architecture has been designed, capable of being divided for the reception of patients of both sexes, with rooms for isolation, etc.

North Dakota.—*State Hospital for the Insane, Jamestown.*—The following improvements have been made or are under construction at the present time:

A $95,000 hundred-bed women's ward building, a $2500 slaughter house, a $1500 artesian well, a $7500 laundry addition, a $7500 dairy barn, a $1200 garden house.

Ohio.—*Massillon State Hospital, Massillon.*—Owing to the recent change in this state in the government of state institutions, through the enactment of the Russell Bill creating an Ohio Board of Administration, the office of steward is abolished. William Sorg who has occupied this position for the past year has therefore severed his connection with this hospital.

The new dairy barn, of which mention has been made, has been completed. It is constructed of brick and cement and is one of the finest dairy barns in the state. It accommodates 160 cows giving an ample supply of milk which can be properly cared for in the new milk house erected at the same time.

An additional Carbo-Via roadway is being constructed through the grounds which when completed will make a half mile of excellent roadway.

Owing to the abundant supply of farm products it has been necessary to construct a root cellar 60 x 40 x 9 feet for storage purposes. There are 950 acres in the farm.

There has been no outbreak of contagious or infectious diseases during the past year.

—*Columbus State Hospital, Columbus.*—The sun porches and tubercular wards which have been under construction during the past year have been completed and are now in use.

An appropriation has been made for the improvement and enlargement of the store room at the hospital, and the construction of a new bake shop is in contemplation.

PENNSYLVANIA.—A committee of the Philadelphia Council has recommended the immediate erection of a hospital for insane at Byberry. As is well known, Blockley is over crowded and the city is now paying for 1930 patients in Norristown and elsewhere. It was suggested that an appropriation be made for a temporary building at Byberry to house 400 able-bodied patients who can prepare the ground for the new buildings. It is proposed to erect semi-detached buildings connected by corridors and tunnels, that the institution be equipped with common dining rooms, except in the infirmaries and wards for feeble and unclean cases. There is to be a separate kitchen building, laundry, workshops, convalescent building, infirmaries, attendants' homes, recreation buildings, auditorium, chapels, power plant, surgical operating room, and a morgue. The tract of land at Byberry contains 800 acres which will give ample room for the above. The state is to join with the city in the cost of the erection of these buildings. A tract of 55 acres which adjoins the House of Correction will be the site of a home for indigent men. On another tract of 135 acres adjoining the Torresdale filtration plant will be erected a number of cottages which will form a home for feeble-minded women and children. It is planned to furnish the heat, light and power from the plants of the House of Correction and the Torresdale pumping station.

—*State Hospital for the Insane, Warren.*—A little over a year ago we recorded the dismissal of Dr. Morris Guth as superintendent by the trustees of this hospital and heard rumors of some disagreement as being the cause. We naturally expected that some official note would be made of this occurrence in the report for the fiscal year, but when it reached us nothing was said in praise or blame of Dr. Guth by the trustees and excepting for a brief note by the superintendent, Dr. Hawke, it might have been supposed that there had been no change in this office. Later, however, a minority report of trustees, by Messrs. Charles C. Shirk and Rufus B. Stone gave information of a change in by-laws under which authority had been taken from the superintendent and given to the "steward and trustees, creating a dual head to the institution which as is well known can never be success-

fully carried out." From the same report it was learned that the pathologist and the principal of the training school were dismissed on account of their sympathy with Dr. Guth, and later followed a strike and legal proceedings which indicated a considerable degree of demoralization. Appeal is made to the State Board of Public Charities and to the Committee on Lunacy to interpose and restore the hospital to its former status.

Recently the trustees have been seeking for a new superintendent and it is reported that Dr. Hawke has resigned, being unable to conduct the hospital to his satisfaction under the present arrangement.

—*Eastern Pennsylvania State Institution for the Feeble-minded and Epileptic, Spring City.*—Building "K" now being furnished, will soon be opened for the accommodation of patients. It is proposed to use this building for high grade feeble-minds, as its situation is such that only this class of patients can be accommodated at this time.

Bids are being received for the erection and construction of a power house and laundry. These buildings are to be constructed of the same kind of materials as the original plant, and will be so constructed as to provide heat, light and laundry facilities for the entire institution when completed.

The semi-annual meeting of the Association of Trustees and Superintendents of the State and Incorporated Hospitals for the Insane and Feeble-minded of Pennsylvania met at this Institution on May 26, 1911. About forty trustees and superintendents were present. The meeting was a very interesting one.

—*Homeopathic State Hospital for Insane, Rittersville.*—A resolution was offered at the last session of the State Senate providing for the appointment of a committee to investigate the status of this hospital upon which $1,700,000 has been expended by the commission in charge of its construction. The commission has been in existence for 10 years yet the hospital has not been completed and has never received a patient.

—*State Hospital for Criminal Insane, Fairview.*—Bids have been opened for the construction of new buildings known as the dining room building, kitchen, bakery, laundry, power building, ice house, reservoir, system of sewage disposal together with equipments.

South Dakota.—*Asylum for Insane Indians, Canton.*—Advertisement has been made for bids on a hospital building which is expected to be erected at this institution. It will accommodate forty patients, will have an operating room, laboratory, and hydrotherapeutic plant. No bids has been awarded as yet.

A residence for the superintendent will also be erected.

In the annual report recommendations will be made for the construction of a building to accommodate 20 epilepties and for a chapel and amusement hall.

TEXAS.—*Southwestern Insane Asylum, San Antonio.*—The last legislature made an appropriation of $45,000 to build and equip a new hospital building. It is intended that it shall be used for the acute and curable cases and will be modern in every respect.

An appropriation of $8000 was also made for the erection of galleries around two wings of the asylum and around two tubercular cottages.

VIRGINIA.—*State Epileptic Colony, Lynchburg.*—This colony has been formally opened and its capacity of 100 beds has been almost filled.

WEST VIRGINIA.—*Second Hospital for the Insane, Spencer.*—At this hospital arrangements are being made to drill a number of wells in order to increase the water supply. The reservoir is also to be repaired and considerable painting is being done.

WISCONSIN.—*Asylum for Chronic Insane, Wauwatosa.*—The Milwaukee County Board of Supervisors has been authorized to issue twenty-year bonds to the amount of $299,950 for the erection of an addition to this hospital. This is necessary on account of the overcrowding, there now being over 286 patients in the institution. The addition will be built on land now owned by the county southeast and southwest of the present buildings, but the county has acquired three farms which, when properly worked, are expected to make the institution self supporting.

It is intended that the buildings which are to be constructed shall be of concrete, faced with brick to match the present buildings and they will be absolutely fireproof. In the basement there will be bathing facilities, a bakery, and room for shops. On the first floor will be commodious day rooms, a large dining hall with a stage for entertainment purposes, an officers' dining room, serving room, and several small rooms. On the second floor will be the dormitories and sleeping rooms. In the above amount are included the cost of furnishing and of the supervising architect.

—*Shawano County Insane Asylum, Shawano.*—Work was started on this new county asylum on September 11, and it is expected that the institution will be completed within a year.

BRITISH COLUMBIA.—*Hospital for the Insane, Coquitam.*—Work at this new hospital is proceeding rapidly and it is expected that it will soon be completed.

NOVA SCOTIA.—*Nova Scotia Hospital, Halifax.*—A new bakery is almost ready for occupation.

Work has been commenced on a building for the treatment of acute cases. Accommodation is provided for 68 patients. The central section will be three stories in height, and will contain the offices, clinical laboratory, operating room, treatment rooms, hydrotherapeutic department, and

quarters for a resident staff. The ward sections will be but a single story high. In the design, effort has been made to approach the general hospital plan as nearly as practicable. Broad, glass-roofed verandas are provided for open air treatment. The continuous bath will be introduced. Wards and corridors will be floored with battleship linoleum.

ONTARIO.—*Hospital for the Insane, Hamilton.*—On the night of August 1, 1911, a disastrous fire occurred in the male side of the main building. In the building are four stories with a basement, but the upper flat only was affected. Many lives were saved by the heroism of the officers and the hospital fire brigade, ably assisted by the city fire fighters. Unfortunately eight dements lost their lives and a ninth died after a few days from acute gastritis and bronchitis due to the inhalation of flames. The repair work is being done but it will be the end of October before patients can be returned to their halls.

Appointments, Resignations, Etc.

ADAIR, DR. VALLOYD. Assistant Physician at Massillon State Hospital at Massillon, Ohio, resigned.

ADAIR, DR. WAITE, appointed Assistant Physician at Massillon State Hospital at Massillon, Ohio.

ALEXANDER, DR. ROSE, Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned July 6, 1911.

ALTVATER, DR. EDWARD G., appointed Pathologist at Maryland Hospital for the Insane at Catonsville.

ANDERSON, DR. PAUL V., Assistant Physician at State Hospital for the Insane at Morganton, N. C., with Drs. James K. Hall and E. M. Gayle, has established a private sanitarium near Richmond, Va.

BABER, DR. E. A., Assistant Physician at Dayton State Hospital, promoted to be Superintendent.

BAKER, DR. AMOS T., Assistant Physician at Matteawan State Hospital at Fishkill Landing, N. Y., resigned.

BARBER, DR. B. B., appointed Interne at Columbus State Hospital at Columbus, Ohio, June 1, 1911.

BARBER, DR. WILLIAM C., Assistant Physician at Rockwood Hospital for the Insane at Kingston, Ontario, resigned to establish a private sanitarium at Orilla.

BARLOW, DR. CHARLES A., Health Officer of Wheeling, W. Va., appointed Superintendent of Second Hospital for the Insane at Spencer, W. Va., July 1, 1911.

BARNES, DR. EDMUND J., Medical Interne at Manhattan State Hospital at Wards Island, N. Y., promoted to be Junior Physician June 14, 1911.

BARRETT, DR. THOMAS M., appointed First Assistant Physician at Dixmont Hospital for the Insane at Dixmont, Pa.

BEAUCHAMP, DR. H. K., appointed Superintendent of Territorial Asylum for the Insane at Phoenix, Arizona, January 14, 1911.

BELL, DR. WILLIAM HENRY, from 1865 to 1868 attending Physician at the Southern Ohio Hospital for the Insane at Dayton, died at his home in Logansport, May 3, 1911, from cerebral hemorrhage, aged 71.

BELLINGER, DR. CLARENCE H., appointed Junior Physician at Binghamton State Hospital at Binghamton, N. Y.

BENNETT, DR. ALBERT H., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., April 1, 1911, and resigned August 14, 1911.

BETTS, DR. JOSEPH B., Assistant Physician and Pathologist at Buffalo State Hospital at Buffalo, N. Y., promoted to Second Assistant Physician, continuing his duties as Pathologist.

BISCH, DR. LOUIS E., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., June 9, 1911.

BLACKBURN, DR. ISAAC WRIGHT, Pathologist at Government Hospital for the Insane at Washington, D. C., died June 19, 1911, of chronic enterocolitis, aged 59.

BLAISDELL, DR. RUSSELL E., Assistant Physician at Binghamton State Hospital at Binghamton, N. Y., resigned to enter private practice.

BLANK, DR. HENRY, Second Assistant Physician at Maryland State Hospital for the Insane at Catonsville, resigned.

BOWERS, DR. PAUL E., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., resigned April 14, 1911, to accept a position in the Indiana State Prison.

Brannon, Dr. E. H., appointed Assistant Physician at Second Hospital for the Insane at Spencer, W. Va.

Brown, Dr. George W., appointed Superintendent of Eastern State Hospital at Williamsburg, Va., May 15, 1911.

Brown, Dr. John Randolph, formerly Assistant Superintendent at East Tennessee Hospital for the Insane at Knoxville, died July 15, 1911, from nervous breakdown, aged 56.

Brown, Dr. Sanger, II, Assistant Physician at Sheppard and Enoch Pratt Hospital at Towson, Md., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., September 1, 1911.

Brunk, Dr. Oliver C., Superintendent of Eastern State Hospital at Williamsburg, Va., resigned May 15, 1911.

Burris, Dr. M. G., Assistant Physician at Nova Scotia Hospital at Halifax, resigned to enter private practice.

Carlisle, Dr. Chester L., Assistant Physician at Willard State Hospital at Willard, N. Y., promoted to be Second Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., August 31, 1911.

Chapman, Dr. Ross McClure, Assistant Physician at Binghamton State Hospital at Binghamton, N. Y., promoted to be Second Assistant Physician.

Cheney, Dr. Clarence O., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., June 9, 1911.

Chetwynd, Dr. J. W., Assistant Physician at Massillon State Hospital at Massillon, Ohio, resigned.

Childs, Dr. J. R. N., Assistant Physician at Ontario Hospital for the Insane at Hamilton, resigned to take up special work in pathology and bacteriology at London, Ontario.

Clarke, Dr. Charles K., Superintendent of Toronto Hospital for the Insane at Toronto, Ontario, appointed Superintendent of Toronto General Hospital.

Clarke, Dr. Harold M., Medical Interne at Manhattan State Hospital at Wards Island, N. Y., resigned March 18, 1911.

Clogher, Dr. Ralph E., Medical Interne at Utica State Hospital at Utica, N. Y., promoted to be Junior Assistant Physician, April 15, 1911.

Courtney, Dr. J. Elvin, formerly First Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., died at his home in Denver, Col., June 23, 1911, from pleurisy.

Darvas, Dr. Margarete, appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., July 1, 1911.

De La Hoyde, Dr. T. Grover, appointed Junior Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y.

De Witt, Dr. Grace, appointed Medical Interne at Government Hospital for the Insane at Washington, D. C., July 26, 1911.

Dexter, Dr. Roger, Junior Physician at Dannemora State Hospital at Dannemora, N. Y., promoted to be Assistant Physician June 10, 1910.

Diehl, Dr. J. Ernest, appointed Junior Assistant at New Jersey State Hospital at Trenton.

Dirks, Dr. Charles B., Assistant Physician at Kankakee State Hospital at Kankakee, Ill., appointed Assistant Superintendent at Elgin State Hospital at Elgin, Ill.

Dodge, Dr. Percy L., Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., transferred to Hudson River State Hospital at Poughkeepsie, N. Y.

Dodson, Dr. E. H., First Assistant Physician at Second Hospital for the Insane at Spencer, W. Va., since June, 1897, died February 22, 1911.

Donoghue, Dr. James K., appointed Medical Interne at Craig Colony at Sonyea, N. Y., April 26, 1911, and resigned June 10, 1911.

Doran, Dr. Robert E., State Medical Inspector, appointed Superintendent of Long Island State Hospital at Brooklyn, N. Y., May 1, 1911, and died Sept. 23, 1911.

Dragoo, Dr. C. H., Second Assistant Physician at Cherokee State Hospital at Cherokee, Iowa, resigned to enter the United States Navy.

DYNAN, DR. NICHOLAS J., Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be Assistant Physician April 13, 1911.

EATON, DR. HENRY D., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., August 1, 1911.

ECKEL, DR. JOHN L., Assistant Physician at Buffalo State Hospital at Buffalo, N. Y., resigned September 15, 1911, to go abroad for a year's study in nervous and mental diseases with the expectation of filling a teaching position in these branches in the Medical Department of the University of Buffalo upon his return.

FIDLER, DR. E. F., Demonstrator in Pathology at University of Minnesota at Minneapolis, appointed Pathologist at Ontario Hospital for the Insane at Hamilton.

FITCH, DR. ARTHUR CASE, formerly Night Medical Officer at Government Hospital for the Insane at Washington, D. C., died suddenly April 6, 1911, from cerebral meningitis, aged 34.

FLETCHER, DR. CHRISTOPHER, Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., transferred to Willard State Hospital at Willard, N. Y., September 1, 1911.

FORSTER, DR. J. M., Superintendent of Hospital for the Insane at Brookville, Ontario, appointed Superintendent of Toronto Hospital for the Insane.

FRARY, DR. L. A., Second Assistant Physician at Napa State Hospital at Napa, California, resigned on account of ill health.

FREEMMEL, DR. ISAAC F., Assistant Physician at Elgin State Hospital at Elgin, Ill., temporarily transferred to Illinois Hospital for Feeble-Minded at Lincoln.

GALLEN, DR. JOSEPH M., Interne at Columbus State Hospital at Columbus, Ohio, resigned.

GAYLE, DR. E. M., Assistant Physician at Burn Brae near Philadelphia, with Drs. James K. Hall and Paul V. Anderson, has established a private sanitarium near Richmond, Va.

GEORGE, DR. JOHN C., Assistant Physician at Dayton State Hospital at Dayton, Ohio, appointed Superintendent of Miami Valley Hospital.

GLOVER, DR. JOHN F., Assistant Superintendent of Southern Indiana Hospital for the Insane, resigned.

GLUECK, DR. BERNARD, Junior Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be Assistant Physician April 13, 1911.

GRAY, DR. EARLE V., Junior Physician at Gowanda State Hospital at Gowanda, N. Y., promoted to be Assistant Physician October 1, 1911.

GRAY, DR. JOHN W., appointed Medical Interne at Binghamton State Hospital at Binghamton, N. Y.

GREEN, DR. EDWARD C., Assistant Physician at Eastern Michigan Asylum at Pontiac, resigned.

GREENE, DR. JAMES L., Alienist of Illinois Board of Administration, appointed Superintendent of Arkansas State Hospital at Little Rock September 1, 1911.

HALL, DR. JAMES K., Assistant Physician at Hospital for the Insane at Morganton, N. C., with Drs. Paul V. Anderson and E. M. Gayle, has established a private sanitarium near Richmond, Va.

HARRIS, DR. WILLIAM A., Assistant Physician at Binghamton State Hospital at Binghamton, N. Y., resigned to enter private practice.

HAWKE, DR. W. W., Superintendent of State Hospital for the Insane at Warren, Pa., resigned.

HELLWEG, DR. ELIZABETH S., Junior Physician at Manhattan State Hospital at Wards Island, N. Y., promoted to be Assistant Physician August 1, 1911.

HOLLEY, DR. ERVING, Assistant Physician at Willard State Hospital at Willard, N. Y., promoted to be Second Assistant Physician at Long Island State Hospital at Brooklyn, N. Y., August 1, 1911.

HOOVER, DR. CLAYTON A., Superintendent of Idaho State Insane Asylum at Blackfoot, resigned to enter private practice in Pocatello.

HUTTON, DR. WILLIAM S., appointed Assistant Physician at State Hospital No. 4 at Farmington, Mo.

JACKSON, DR. ROY C., appointed Second Assistant Physician at Hartford Retreat at Hartford, Conn., July 1, 1911, and recently granted leave of absence to pursue studies in neurology and psychiatry in New York.

JEFFRIES, DR. EDWIN F., appointed Assistant Physician at Ontario Hospital for the Insane at Hamilton.

JENKS, DR. FRANK H., Assistant Superintendent of Elgin State Hospital at Elgin, Ill., resigned May 10, 1911, to take charge of the Ransom Sanitarium at Rockford, Ill. He was tendered a farewell dinner by the Superintendent, Dr. Wilgus, and presented with an office chair and a purse of money by the medical staff.

KARPAS, DR. MORRIS J., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., promoted to be Second Assistant Physician August 1, 1911.

KELLCHER, DR. JAMES P., appointed Medical Interne at Manhattan State Hospital at Wards Island, N. Y., April 22, 1911, and promoted to be Junior Physician, September 5, 1911.

KELLY, DR. WILLIAM E., Medical Interne at Middletown State Homeopathic Hospital at Middletown, N. Y., promoted to be Junior Physician August 1, 1911.

KENT, MISS GRACE HELEN, Assistant Psychologist at Government Hospital for the Insane at Washington, D. C., resigned August 7, 1911.

KETCHERSIDE, DR. J. A., Superintendent of Territorial Asylum for the Insane at Phoenix, Arizona, resigned.

KIBBEY, DR. RICHARD G., appointed Medical Interne at Craig Colony at Sonyea, N. Y., June 15, 1911.

LAMB, DR. ROBERT M., Superintendent of Matteawan State Hospital at Fishkill Landing, N. Y., resigned.

LA MOURE, DR. CHARLES T., Second Assistant Physician at Rochester State Hospital at Rochester, N. Y., appointed Superintendent of Gardner State Colony at Gardner, Mass.

LAVESON, DR. HYMAN, Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician June 30, 1911, and resigned August 31, 1911.

LLOYD, DR. HENRY, Assistant Physician at State Hospital No. 4 at Farmington, Mo., resigned.

LYON, DR. SAMUEL B., Superintendent at Bloomingdale Hospital at White Plains, N. Y., resigned July 1, 1911.

LYONS, DR. AUGUSTUS J., Superintendent of Second Hospital for the Insane of West Virginia at Spencer, died June 1, 1911, from quinsy, aged 38.

MCALLISTER, DR. BENJAMIN R., Superintendent of State Hospital for the Insane at Jamestown, North Dakota, resigned to enter private practice in King City, Mo.

MCGEE, DR. ROBERT S., appointed Assistant Superintendent of State Hospital No. 1 at Fulton, Mo.

MCLEISH, DR. ALEXANDER H., Assistant Superintendent at Western Washington Hospital for the Insane at Fort Steilacoom, promoted to be Superintendent.

MCMURRAY, DR. G. B., appointed Junior Assistant Physician at New Jersey State Hospital at Morris Plains, June 5, 1911.

MACNAUGHTON, DR. THOMAS, appointed Assistant Superintendent at Ontario Hospital for the Insane at Hamilton, April 1, 1911.

MALLON, DR. PETER S., First Assistant Physician at New Jersey State Hospital at Morris Plains, resigned May 1, 1911, after a service of seventeen years. He was the recipient of a testimonial and a handsome present from the staff.

MANN, DR. HERBERT C., appointed Medical Interne at Buffalo State Hospital at Buffalo, N. Y., June 1, 1911.

MARSHALL, DR. WILLIAM A., appointed Assistant Physician at Ontario Hospital for the Insane at Hamilton.

MARTIN, DR. E. W., Fourth Assistant Physician at Cherokee State Hospital at Cherokee, Iowa, promoted to be Third Assistant Physician.

MATTHEWS, DR. ADELBERT C., Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., appointed First Assistant Physician at Napa State Hospital at Napa, California.

MAY, DR. HERMAN F., Assistant Physician at Matteawan State Hospital at Fishkill Landing, N. Y., transferred to Hudson River State Hospital at Poughkeepsie, N. Y.

MAY, DR. JAMES V., First Assistant Physician at Binghamton State Hospital at Binghamton, N. Y., appointed Superintendent of Matteawan State Hospital at Fishkill Landing, N. Y.

MELLEN, DR. HARRY C., Second Assistant Physician at Hartford Retreat at Hartford, Conn., resigned to enter private practice.

MIKELS, DR. F. M., appointed Interne at New Jersey State Hospital at Morris Plains, August 15, 1911.

MITCHELL, DR. JOHN C., Assistant Superintendent of Ontario Hospital for the Insane at Hamilton, appointed Superintendent of Provincial Hospital for Insane at Brockville, Ontario.

MITCHELL, DR. ROY E., Second Assistant Physician at Middletown State Homeopathic Hospital at Middletown, N. Y., resigned July 21, 1911, to enter private practice at Eau Claire, Wis.

MONTGOMERY, DR. WILLIAM H., Second Assistant Physician at Kings Park State Hospital at Kings Park, N. Y., transferred to Willard State Hospital at Willard, N. Y., September 1, 1911.

MOOERS, DR. EMMA WILSON, formerly connected with the Worcester State Hospital at Worcester, Mass., and the Michigan State Hospital at Kalamazoo, Curator of the Neuropathological Department of Harvard Medical School, died May 31, 1911, from septicæmia due to an autopsy wound.

MOORE, DR. ARTHUR S., Assistant Physician at Middletown State Homeopathic Hospital at Middletown, N. Y., and Captain of Medical Corps, N. Y. National Guard, served as Sanitary Officer at the State Camp of the National Guard at Pine Plains, N. Y., August 3-15, 1911.

MYERS, DR. GLENN E., Medical Interne at Manhattan State Hospital at Wards Island, N. Y., promoted to be Junior Physician June 14, 1911, and transferred to the Psychiatric Institute July 15, 1911.

NORBURY, DR. FRANK P., Superintendent of Kankakee State Hospital at Kankakee, Ill., appointed Alienist of Illinois Board of Administration September 1, 1911.

O'BRIEN, DR. JOHN D., Pathologist at Massillon State Hospital at Massillon, Ohio, resigned to be Director of the Cleveland Rest Cure Sanitarium near Strongville.

PAGE, DR. FRANK WILFRED, from 1897 to 1899 Superintendent of Vermont State Hospital at Waterbury, died August 2, 1911, aged 67.

PARSONS, DR. F. W., Second Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., promoted to be First Assistant Physician.

PARTRIDGE, DR. HARRY I., Junior Physician at Kings Park State Hospital at Kings Park, N. Y., transferred to Binghamton State Hospital at Binghamton, N. Y., June 1, 1911, and promoted to be Assistant Physician August 1, 1911.

PARTRIDGE, DR. J. CARLTON, appointed Junior Physician at Binghamton State Hospital at Binghamton, N. Y.

PECIVAL, DR. JOSEPH P., Superintendent of Cook County Institutions at Dunning, Ill., resigned.

PETTIBONE, DR. R. S., Medical Interne at Craig Colony at Sonyea, N. Y., appointed Junior Assistant Physician at Willard State Hospital at Willard, N. Y., September 15, 1911.

POLLOCK, DR. JAMES K., Junior Assistant Physician at New Jersey State Hospital at Trenton, appointed First Assistant Physican at Southeastern Hospital for the Insane at Madison, Indiana.

POOLE, DR. FRANCIS H., appointed Superintendent of Idaho State Insane Asylum at Blackfoot.

PORTER, DR. WILLIAM C., Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y., appointed Third Assistant Physician at Napa State Hospital at Napa, California.

POWELL, DR. M. J., Assistant Physician at Missouri Colony for Feeble-Minded and Epileptic at Marshall, resigned.

PRIDDY, DR. ALBERT S., appointed Superintendent of State Epileptic Colony, at Lynchburg, Va.

PRICE, DR. R. T., Assistant Physician at State Hospital No. 3 at Nevada, Missouri, resigned August 15, 1911, to enter private practice in Independence.

PRITCHARD, DR. WILLIAM A., Superintendent of Ohio State Hospital for Epileptics at Gallipolis, resigned to enter private practice.

PUETT, DR. BESSIE, Assistant Physician at Eastern State Hospital at Williamsburg, Va., resigned to enter private practice in Dallas.

ROGERS, DR. J. B., Third Assistant Physician at Napa State Hospital at Napa, California, promoted to be Third Assistant Physician.

RUNKEL, DR. JOHN G., appointed Second Assistant Physician at Maryland Hospital for the Insane at Catonsville.

RUSSELL, DR. CLARENCE L., of Binghamton State Hospital at Binghamton, N. Y., appointed Assistant Physician at Matteawan State Hospital at Fishkill Landing, N. Y.

RUSSELL, DR. JOHN W., Second Assistant Physician at Willard State Hospital at Willard, N. Y., promoted to be First Assistant Physician at Matteawan State Hospital at Fishkill Landing, N. Y., August 20, 1911.

RUSSELL, DR. ROSE, Interne at Cherokee State Hospital at Cherokee, Iowa, promoted to be Fourth Assistant Physician.

RUSSELL, DR. WILLIAM L., Superintendent of Long Island State Hospital at Brooklyn, N. Y., resigned May 1, 1911, to be Superintendent of Bloomingdale Hospital at White Plains, N. Y.

SCHIER, DR. A. P., appointed First Assistant Physician at Southern Indiana Hospital at Evansville.

SCHWINN, DR. GEORGE H., Senior Assistant Physician at Government Hospital for the Insane at Washington, D. C., promoted to be First Assistant Physician April 13, 1911.

SICARD, DR. CLARENCE L., appointed Junior Assistant Physician at Hudson River State Hospital at Poughkeepsie, N. Y.

SHEPHERD, DR. ARTHUR F., Superintendent of Dayton State Hospital at Dayton, Ohio, appointed to State Board of Control of Ohio Institutions.

SMITH, DR. PHILIP, Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., promoted to be Second Assistant Physician August 1, 1911.

SMITH, DR. WILLIAM A., Junior Assistant in charge of the laboratory at Willard State Hospital at Willard, N. Y., promoted to be Assistant Physician.

SOMERS, DR. ELBERT, Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., appointed Medical Inspector of State Commission in Lunacy.

SOPER, DR. ARTHUR E., appointed Junior Physician at Manhattan State Hospital at Wards Island, N. Y., September 10, 1911.

STEPHENS, DR. G. W., First Assistant Physician at East Mississippi State Hospital at Meridian, appointed First Assistant Physician at Territorial Asylum for the Insane at Phoenix, Arizona.

STEWART, DR. ALBERT C., appointed Assistant Superintendent of Western Washington Hospital for the Insane at Fort Steilacoom.

STRANSKY, DR. JOSEPHINE, Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to be chief of the Training School June 1, 1911.

TADDIKEN, DR. PAUL G., Second Assistant Physician at Long Island State Hospital at Brooklyn, N. Y., appointed First Assistant Physician at St. Lawrence State Hospital at Ogdensburg, N. Y., July 1, 1911.

TATJE, DR. ORAL D., Assistant Physician at Massillon State Hospital at Massillon, Ohio, promoted to be Pathologist.

THORNE, DR. JOHN H., Medical Interne at Government Hospital for the Insane at Washington, D. C., promoted to be Junior Assistant Physician, April 13, 1911.

THROCKMORTEN, DR. T. B., appointed Second Assistant Physician at Cherokee State Hospital at Cherokee, Iowa.

TIFFANY, DR. WILLIAM J., Assistant Physician at Binghamton State Hospital at Binghamton, N. Y., promoted to be Second Assistant Physician at Matteawan State Hospital at Fishkill Landing, N. Y., and later transferred to Binghamton State Hospital.

TILLER, DR. JOHN A., appointed Assistant Physician at State Hospital No. 4 at Farmington, Mo.

TODD, DR. LEONA E., appointed Woman Physician at Hudson River State Hospital at Poughkeepsie, N. Y.

TOWNSEND, DR. THEODORE I., formerly First Assistant Physician at Bloomingdale Hospital at White Plains, N. Y., appointed First Assistant Physician at Binghampton State Hospital at Binghamton, N. Y., September 25, 1911.

TRIGGS, DR. LOUISE B., appointed Woman Physician at Western Kentucky Asylum for the Insane at Hopkinsville.

TYTLER, DR. W. H., Pathologist at Ontario Hospital for the Insane at Hamilton, resigned August, 1911, to do research work at the Rockefeller Institute.

VESSIE, DR. PERCY R., appointed Junior Physician at Gowanda State Hospital at Gowanda, N. Y., May 9, 1911.

WASHBURN, DR. PHILIP C., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., transferred to Kings Park State Hospital at Kings Park, N. Y.

WATERMAN, DR. JAMES A., Head Physician at State Penitentiary at Jefferson City, Mo., appointed Superintendent of State Hospital No. 4 at Farmington, Mo.

WEBER, DR. F. S., Assistant Physician at State Hospital No. 4 at Farmington, Mo., resigned.

WELLS, DR. JACOB M., formerly Assistant Physician at Iowa Hospital for the Insane, died at his home from heat exhaustion, July 2, 1911.

WILLARD, DR. LUVIA, Medical Interne at Long Island State Hospital at Brooklyn, N. Y., resigned July 1, 1911, to enter private practice.

WILLIAMS, DR. RODNEY R., appointed Junior Physician at Binghamton State Hospital at Binghamton, N. Y., June 1, 1911.

WILGUS, DR. SIDNEY D., Superintendent at Elgin State Hospital at Elgin, Ill., appointed Superintendent of Kankakee State Hospital at Kankakee, Ill.

WRIGHT, DR. HAROLD W., Assistant Physician at Manhattan State Hospital at Wards Island, N. Y., resigned July 22, 1911.